

**GRAS Notice for Marigold Extract Derived
from *Tagetes erecta* for Use in Food for Cats and Dogs**

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GRAS Notice for Marigold Extract Derived from *Tagetes erecta* for Use in Food for Cats and Dogs

1. §570.225 Part 1: Signed Statements and Certification

In accord with 21 CFR §570. Subpart E, Royal Canin is submitting a Generally Recognized as Safe (GRAS) notice for the use of marigold extract derived from *Tagetes erecta* in food for cats and dogs as a nutritive antioxidant.

1.2. Name and Address of Organization

Royal Canin
500 Fountain Lake Blvd #100
St. Charles, MO 63301

1.3. Name of the Notified Substance

The common name of the notified substance is marigold extract.

1.4. Intended Conditions of Use

Marigold extract is intended for use as a nutritive antioxidant in food for puppies at levels up to 20 mg/kg dry matter (DM) lutein, and in food for kittens, adult cats, and adult dogs at levels up to 80 mg/kg DM lutein in finished pet food.

1.5. Statutory Basis for the Conclusion of GRAS Status

Marigold extract has been concluded to have GRAS status for use as a nutritive antioxidant in food for cat and dogs for all life stages based upon scientific procedures in accordance with § 570.30(a) and (b).

1.6. Premarket Exception Status

Royal Canin hereby informs the U.S. FDA of the view that marigold extract is not subject to the premarket approvals requirements of the Federal Food, Drug and Cosmetic Act (FFDCA) based on Royal Canin's conclusion that the notified substance is GRAS under the conditions of intended use as a nutritive antioxidant in food for cats and dogs.

1.7. Availability of Information

(A) The data and supporting information that is utilized as the basis for the GRAS notification will be made available to the FDA for review and copying upon request during customary business hours at the offices of:

Royal Canin
500 Fountain Lake Blvd #100

St. Charles, MO 63301

(B) Upon request, Royal Canin will provide FDA with a complete copy of the data and information either in an electronic format that is accessible for evaluation or on paper.

1.8. Freedom of Information Act, 5 U.S.C 552

Royal Canin has designated the following data and information contained in Parts 2 through 7 and appendices of this notice as proprietary and confidential and exempt from the Freedom of Information Act, 5 U.S.C. Section 552:

Section 2.2.2

Section 2.3.1

Appendix 1

Appendix 5A-C

Appendix 10

Appendix 11

1.9. Certification

Royal Canin hereby certifies that to the best of our knowledge, this GRAS notice is a complete, representative, and balanced submission that includes unfavorable information, as well as favorable information, known to Royal Canin and pertinent to the evaluation of the safety and GRAS status for the use of marigold extract as a nutritive antioxidant in food for cats and dogs up to 80 mg/kg lutein.

Signed,

(b) (6)

Mason Ward, Ph.D.
Director, Regulatory Affairs
Royal Canin

12/20/24
Date

2. §570.230 Part 2: The Identity, Method of Manufacture, Specifications, and Physical or Technical Effect

2.1. Identity

2.1.1. Description

Marigold extract is derived from the flowers of *Tagetes erecta*. Marigold petals, due to their color and nutritional value have been routinely fed to farm animals, such as chickens. Marigold extract, when incorporated into the diets for chickens, greatly enhances egg yolk pigmentation due to the bright yellow coloration of the extract (Lokaewmanee 2011).

Marigold, like many plants, contains high levels of carotenoids, particularly the yellow pigment lutein. For this reason, marigold extract has historically been used as a color additive in chicken feed and a natural flavor for human food and animal feed. In the United States, preparation of marigold as an oil from *T. patula* L., *T. erecta* L., or *T. minuta* L. (*T. glandulifera* Schrank) is approved for safe use in human food either as a natural flavoring substance or as a substance used in conjunction with flavoring substances under 21 C.F.R. § 172.510. These substances are also permitted for use in all animal feed, including cat and dog food when in oil form, as a "natural flavor" under 21 C.F.R. § 501.22(a)(3).

Marigold extract contains a significant quantity of lutein, which is widely researched based on its potent antioxidant properties due to the presence of multiple conjugated double bonds and hydroxyl end groups within the structure that react with free radicals to form a more stable unreactive product (Ahn et al., 2021). It is for this reason that lutein is the primary constituent from marigold that will be used to define the estimated daily intakes, safety limits, and be the analytical reference for the extract.

2.1.2. Identity

Carotenoids are classified into two categories based on their chemical composition: xanthophylls and carotenes. Carotenes are composed solely of carbon and hydrogen, while xanthophylls contain additional elements beyond these two. Lutein is a xanthophyll or oxycarotenoid that contains two cyclic end groups (one β - and one ϵ -ionone ring) and the skeletal C40 isoprenoid structure, which is common to all carotenoids (see Figure 2-2). Lutein is found in two chemical forms in its natural state: either esterified with fatty acids (lutein esters, Figure 2-1) at the two hydroxyl end groups or in a "free" non-esterified form (free lutein, Figure 2-2). Lutein esters represent the predominant form found naturally in marigold extract, typically esterified with one or more of the following fatty acids: palmitate, myristate, or stearate (Piccaglia et al., 1998). However, a saponification process can be employed during manufacturing to remove the fatty acids to generate free lutein. In commercially available marigold extracts both forms of lutein are found depending on supplier.

Table 2-1 Chemical Description of Lutein Esters

Common Name	Lutein Esters
International chemical name (IUPAC)	(3R,3'S,6'S)- β,ϵ -carotene-3,3'-diol dipalmitate
Synonyms	Xanthophyll Esters
Chemical abstract service number (CAS)	547-17-1
Empirical Formula	C ₇₂ H ₁₁₆ O ₄

Molecular Mass	1045.71 g/mol
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Figure 2-1 Structural Formula for Lutein Esters

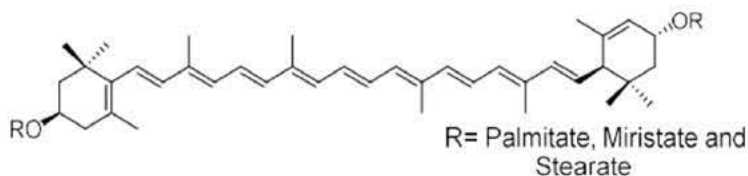
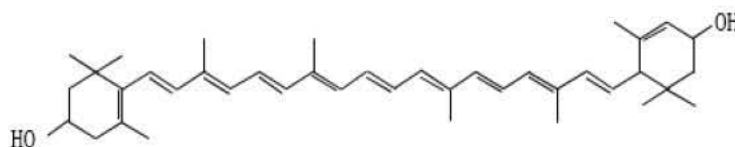


Table 2-2 Chemical Description of “Free” Lutein

Common Name	Lutein
International chemical name (IUPAC)	(3R,6R,3'R)-β,ε-carotene-3,3'-diol
Synonyms	Luteine; all- <i>trans</i> -lutein; Xanthophyll
Chemical abstract service number (CAS)	127-40-2
Empirical Formula	C ₄₀ H ₅₆ O ₂
Molecular Mass	568.88

Figure 2-2 Structural Formula for Lutein



2.2. Manufacturing Lutein Esters and Free Lutein

(b) (4). produces marigold extract under the trade name (b) (4) and (b) (4) produces marigold extract under the trade name (b) (4). The manufacturing processes for marigold extract from both suppliers are outlined in the flow diagrams shown in Figure 2-3. Hybridized marigold (*Tagetes erecta*) flowers from different geographical locations are sourced and used in the process. Hexane extraction of the dried flowers followed by solvent removal results in the carotenoid-enriched oleoresin.

(b) (4)

(b) (4) All raw materials used in production are considered safe and suitable for the manufacture of a feed ingredient.

Figure 2-3 Marigold Extract (MGE) Manufacturing Process: (b) (4)
(b) (4)

(b) (4)

2.2.1. Composition of Marigold Oleoresins

The composition of at least 3 lots of marigold oleoresin from both suppliers was characterized for the chemical constituents listed in Table 2-3, and their respective concentrations are reported. Certificates of Analysis for compositional testing for (b) (4) and (b) (4) are provided in Appendices 1 and 2. As noted above, the form of lutein contained in the oleoresin varies between the two suppliers, so compositional testing was performed on oleoresin from both manufacturing processes, with ((b) (4) or without ((b) (4) saponification. The lutein analysis method (AOAC 970.64 Carotenes and xanthophylls in dried plant materials and mixed feeds) incorporates a saponification step, which allows for the determination of lutein content based on the free form, rather than differentiating between lutein esters or free lutein.

Table 2-3 Chemical Composition of the Marigold Oleoresin: A) (b) (4)® B) (b) (4)

Principal Components	A) (b) (4) Sample ID (Lot #)	
	Marigold Oleoresin	
Total Carotenoids (g/kg)	(b)	(4)
Lutein (g/kg)		
% Lutein of total carotenoids		
Zeaxanthin (g/kg)		
% Zeaxanthin of total carotenoids		
Waxes (%)		
Moisture (%)		
Ash (%)		
Fatty Acids (%)		
Principal Components	B) (b) (4) Sample ID (Lot #)	
	Saponified Marigold Oleoresin	
Total Carotenoids (g/kg)	(b)	(4)
Lutein (g/kg)		

% Lutein of total carotenoids	(b) (4)
Zeaxanthin (g/kg)	
% Zeaxanthin of total carotenoids	
Waxes (%)	
Moisture (%)	
Ash (%)	
Fatty Acids (%)	

Compositional oleoresin analysis from both suppliers of marigold revealed a total carotenoid content ranging from 13 to 17%, with the total amount of lutein and zeaxanthin being approximately 12% and 0.8%, respectively. The concentration of lutein in both oleoresins is comparable between suppliers. Lutein represents a minimum of 70% of the total carotenoid concentration, with a markedly higher percentage derived from the (b) (4) process, which involves saponification to produce free lutein. It should be noted that the change in lutein percentage cannot be solely attributed to the saponification step. The difference in the moisture and ash quantity can be directly associated with saponification, particularly from the use of water and (b) (4) to saponify the oleoresin to remove the fatty acids from lutein. (b) (4) reacts with the fatty acids to hydrolyze the ester linkage, forming a (b) (4) with fatty acids (soap). This process increases the ash content (inorganic content) and the overall moisture amount while diluting down the fatty acid quantity, with the addition of water during the reaction. The additional components identified in marigold oleoresin include crude fiber (1-2%) and nitrogen-free extracts consisting of carbohydrates such as sugars, starches, and hemicellulose (18-25%) (EFSA Journal 2019).

A comparative analysis of the manufacturing processes of (b) (4) and (b) (4) with those of other suppliers of marigold extracts reveals that both companies employ similar techniques for the isolation of oleoresin and lutein, irrespective of the lutein chemical form. Nevertheless, the primary distinction lies in the incorporation of supplementary processing that occurs after hexane extraction, with the objective of further purifying and concentrating marigold extract for lutein content, thereby enhancing the overall lutein amount not encompassed by the aforementioned processes.

2.2.2. Composition of Commercial Marigold Extracts

The composition of the commercial marigold extracts, (b) (4) and (b) (4) are listed in Tables 2-4 and 2-5. Except for marigold extract, all components in both commercial formulations are suitable for their intended purpose and are AAFCO-approved with no species restrictions. Marigold extract is approved as a color additive for chicken feeds.

Table 2-4 Composition of (b) (4)

Ingredient	Function	% Inclusion Range	CFR	AAFCO Definition
(b) (4)	Flow aid	(b) (4)		(b) (4)
Marigold Extract	Lutein Source			

(b) (4)	Carrier	(b) (4)	(b) (4)
(b) (4)	Flavor	(b) (4)	(b) (4)

Table 2-5 Typical Composition of (b) (4)

Ingredient	Function	% Inclusion Range	CFR	AAFCO Definition
Marigold Extract (Saponified Oil)	(b) (4)	(b) (4)	(b) (4)	(b) (4)
(b) (4)	(b) (4)	(b) (4)	(b) (4)	(b) (4)

*Typical amount of Marigold Extract ~ 15.2%

2.3. Product Specifications

Physical and chemical specifications for both commercial marigold extracts were established by the associated suppliers, (b) (4), and the results for three independent lots for each commercial extract are shown in Tables 2-6 and 2-7, which demonstrate compliance and lot-to-lot consistency to the established specifications. Certificate of Analyses for each lot of (b) (4) and (b) (4) are provided in Appendices 3 and 4.

Table 2-6 Product Specifications and Analytical Data on 3 Commercial Batches of (b) (4)

Parameter	Method	Specification	Analytical Data
Xanthophylls	UV-Vis (AOAC 970.64)	45.0 - 49.0 g/kg	(b) (4)
Color	Visual	Orange to Brown	
Odor	Organoleptic	Herbal	
Particle Size on US#20 Mesh	Sieve Analysis	0.0 - 2.0 %	

Table 2-7 Product Specifications and Analytical Data on 3 Commercial Batches of (b) (4) Yellow

Parameter	Method	Specification	Analytical Data
			(b) (4)
Attribute Controls			

Appearance and Dispersion	Visual	Flowable homogenous granular powder	Conforms	Conforms	Conforms
Color	Visual	Yellow to dark yellow	Conforms	Conforms	Conforms
Variable Controls					
Total Xanthophylls	UV-Vis (AOAC 970.64)	20.0 – 20.5 g/kg	(b) (4)		
Lutein	HPLC-NP	≥ 80.00 %			
Zeaxanthin	HPLC-NP	≥ 4.00 %			
Mixed Tocopherols	HPLC-RP	≥ 3000.00 ppm			
Residual Ethoxyquin	HPLC-RP	≤ 2.00 ppm			
Saponification	Chromatographic Column	≥ 95.00 %			
Moisture	Halogen Scale	≤ 10.00 %			
Density	Test Tube	0.98 – 1.40 g/cm ³			

N.D. – Not Detected

Lutein analysis is not included within the specifications for (b) (4), since (b) (4) releases the product based on the xanthophyll concentration alone. Three independent batches of (b) (4) were measured for xanthophyll and lutein concentrations to determine what percentage of lutein comprises the total xanthophyll amount. The results are summarized in Table 2.8, demonstrating that lutein constitutes at least 70% of the total xanthophyll amount for marigold extract from both suppliers.

Table 2-8 Xanthophyll and Lutein Analysis on 3 Commercial Batches of (b) (4)

Parameter	Method	Analytical Data		
		Lot	Lot	Lot
Xanthophylls	UV-Vis	(b) (4)		
Lutein	HPLC			
Lutein (%)				

2.3.1. Contaminants

The proposed specifications for the following contaminants: heavy metals, dioxins and PCBs, and pathogenic microbials, covering marigold extract from both suppliers are noted in Table 2-9.

Table 2-9 Proposed Contaminant Specifications for Marigold Extract

Parameter	Specification	Reference
Heavy Metals		
Cadmium	Max 0.05 ppm	

Arsenic	Max 0.5 ppm	Specifications lower than listed in 2024 AAFCO OP, Table 3. "Official Guidelines Suggested for Contaminants in Individual Mineral Feed Ingredients" on Page 307
Lead	Max 1 ppm	
Mercury	Max 0.05 ppm	
Dioxins and PCBs		
Dioxins and furans TEQ-WHO (upper-bound, only PCDD/F)	0.75 ng WHO-PCDD/F-TEQ/kg	EC, 2002. Directive 2002/32/EC of the European Parliament and of the Council of 7 May 2002 on undesirable substances in animal feed, consolidated version as of 28/11/2019
Microbiology		
<i>Salmonella</i>	Absence in 25g	EC, 2011. Commission regulation (EU) no 142/2011 of 25 February 2011.

Heavy metal specifications for marigold extract were determined from the maximum tolerance levels for complete feed specified by the Association of American Feed Control Officials (AAFCO) published annually in the AAFCO Official Publication (OP) covering cadmium, arsenic, lead, and mercury. The limit for dioxins was established using the EU maximum limits outlined under Directive 2002/32/EC for the sum of dioxins of 0.75 ng WHO-PCDD/F-TEQ/kg in feed materials from plant origin. The micro limit proposed for *Salmonella* demonstrating absence of bacteria presence in 25 g of tested material originated from the EU publication Commission regulation (EU) no 142/2011 of 25 February 2011.

Results for contaminant testing from three independent lots for each commercial extract are shown in Tables 2-10 and 2-11. Certificate of Analyses for each lot of (b) (4) and (b) (4) tested are provided in Appendices 5 and 6.

Table 2-10 Contaminant Data on 3 Commercial Batches of (b) (4)

Parameter	Method	Analytical Data		
		Lot	Lot	Lot (b) (4)
Heavy Metals				
Cadmium	J. AOAC vol. 90 (2007) 844-856 (Mod)	(b) (4)	(b) (4)	(b) (4)
Arsenic	J. AOAC vol. 90 (2007) 844-856 (Mod)			
Lead	J. AOAC vol. 90 (2007) 844-856 (Mod)			
Mercury	J. AOAC vol. 90 (2007) 844-856 (Mod)			
Residual Solvents				
n-Hexane	USP/NF 467	(b) (4)		
Dioxins and PCBs				

Dioxins and furans TEQ-WHO (lower-bound, only PCDD/F)	EPA 1613B Oct. 1994	(b) (4)
Dioxins and furans TEQ-WHO (upper-bound, only PCDD/F)	EPA 1613B Oct. 1994	
Microbiology		
<i>Salmonella</i>	FDA BAM Chapter 5	(b) (4)

Table 2-11 Contaminant Data on 3 Commercial Batches of (b) (4)

Parameter	Method	Analytical Data		
		Lot (b) (4)	Lot (b) (4)	Lot (b) (4)
Heavy Metals				
Cadmium	Official Mexican Standard. NOM-117-SSA1 (1994)	(b) (4)	(4)	
Arsenic	AOAC, 2019. AOAC Official Methods 952.13			
Lead	Official Mexican Standard. NOM-117-SSA1 (1994).			
Mercury	National Standards Institute. NCh 2667. Of2001			
Residual Solvents				
		Lot	Lot	Lot
n-Hexane	Gas Chromatography	(b) (4)		
Dioxins and PCBs				
		Lot	Lot	Lot
Dioxins and furans TEQ-WHO (lower-bound, only PCDD/F)	GLS DF 110:2022-06-30, GC-MS/MS	(b) (4)	(4)	
Dioxins and furans TEQ-WHO (upper-bound, only PCDD/F)	GLS DF 110:2022-06-30, GC-MS/MS			
Sum of dioxins and dioxin-like PCBs TEQ-WHO (lower-bound, WHO-PCDD/F+PCB TEQ)	DF:110-3/120-3/130-3/140-4, Calculation			
Sum of dioxins and dioxin-like PCBs TEQ-WHO (upper-bound, WHO-PCDD/F+PCB TEQ)	DF:110-3/120-3/130-3/140-4, Calculation			
Microbiology				
		Lot	Lot	Lot
<i>E. Coli</i>	UNE-EN ISO 16649-3 2017	(b) (4)	(4)	
<i>Salmonella</i>	ISO 6579-1:2017/ AMD 1:2020			

Yeasts	ICMSF Food Microorganisms	(b) (4)
Molds	ICMSF Food Microorganisms	
<i>S. Aureus</i>	FDA Bacteriological Analytical On line. Hypertext.source. Chapter 12. 8th Ed. Revision A, 1998. January 2001	

None of the detected contaminants in products from either supplier represent a food safety concern when marigold extract is used as suggested in food for dogs or cats. In (b) (4)[®], the highest analytical value for hexane of 420 ug/g would result in an exposure of 15.1 (typical use level) - 60.5 (maximum use level) µg/kg bw/day for the smallest puppies, which represents the worst-case scenario. The Agency for Toxic Substances and disease Registry (ATSDR) established a provisional minimal risk level (MRL) of 100 µg/kg bw/day for intermediate duration oral exposure to hexane. This is based on a LOAEL of 43.5 mg/kg bw/day for impaired performance of memory in mice with an uncertainty factor of 300 (ATSDR, 2024). This is an appropriate basis on which to establish an exposure limit for dogs and cats as well. Consequently, there is no risk to animal health due to residual hexane.

2.4. Raw Material Shelf Life and Finished Product Stability and Homogeneity

2.4.1. Raw Material Shelf Life

The shelf life of marigold extract varies between the two suppliers with (b) (4)[®] being 12 months and (b) (4) being 18 months when stored at standard room temperature conditions (25°C) in commercial packaging. The measure of total xanthophylls was chosen as the stability indicating parameter, because lutein accounts for over 70 to 80% of the total xanthophyll quantity and has the same degradation mechanisms (such as oxidation, light, and heat) as other carotenoids. Stability of (b) (4) was demonstrated under both accelerated (37°C) and long-term conditions (ambient 25°C) through multiple studies of variable duration that are summarized in Table 2-12.

Table 2-12 Stability Results for (b) (4) at Accelerated and Long-term Conditions

Lot	Test Interval (Months)						
	Initial	0.5	1	2	4	6	12
Accelerated Conditions (37°C)							
Total Xanthophylls (g/kg)							
(b) (4)	48.75±0.42						(b) (4)
Long-Term Conditions (25°C)							
Total Xanthophylls (g/kg)							
(b) (4)	51.6					(b) (4)	
	52.8						
Lot(b) (4)	47.52						(b) (4)
Lot	49.38						
Lot	45.02						

Lot (b) (4)	46.22					(b) (4)
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The cumulative stability data presented for (b) (4) covering both accelerated and long-term conditions supports product shelf-life with no significant degradation observed below the xanthophyll release specification (45 g/kg), even at accelerated conditions for 6 months (equivalent to 18-24 months at long-term storage; Beaman et al., 2010). Stability for (b) (4) at long-term storage conditions, is presented in Table 2-13.

Table 2-13 Stability Results for 3 Lots of (b) (4) at Long-term Conditions (28 ± 2°C, 65% RH ± 5 % RH)

Lots	Specification	Time (months)	Xanthophylls (g/kg)	Degradation (%)
(b) (4)	Minimum 20 g/kg	0	21.09	0.00
		(b) (4)	(b) (4)	(b) (4)
		0	21.14	0.00
(b) (4)	Minimum 20 g/kg	(b) (4)	(b) (4)	(b) (4)
		0	20.77	0.00
(b) (4)	Minimum 20 g/kg	(b) (4)	(b) (4)	(b) (4)

The stability study results for all 3 batches of (b) (4) complies with the minimum xanthophyll release specification through the 18-month time point, confirming the designated shelf-life defined by (b) (4). In conclusion, stability information presented for each marigold extract verifies the shelf-life assigned by their respective supplier. The overall stability summaries for each supplier are included in Appendix 7.

2.4.2. Marigold Extract Stability in Finished Product

Lutein is susceptible to degradation by multiple mechanisms, including light, heat, and most commonly, oxidation of the polyene backbone and/or hydroxyl end groups (Becerra et al., 2020). The chemical form of lutein can directly affect the stability of marigold extract during manufacturing and over the shelf-life of finished pet foods. A study evaluating the heat and light stability of the different chemical forms of lutein isolated from marigold flowers under stressed conditions found that the fatty acids esterified to the hydroxyl groups in lutein esters protected and minimized degradation compared to free lutein (Subagio et al., 1999). Water or enzymatic hydrolysis of the ester linkage is a vulnerability that removes the stability advantage for lutein esters afforded by the protection of the fatty acids. The worst-case stability condition for the two types of marigold extract in finished pet foods was selected for evaluation. (b) (4) containing free lutein was evaluated in dry pet foods due to the high risk of oxidation during manufacturing and storage. (b) (4) which contains lutein esters, was evaluated in wet pet foods due to the high moisture content (70-80% water) which increases the likelihood of hydrolysis and degradation. Stability for 3 batches of both dry and wet product was conducted under long-term conditions (25°C) in finished packaged pet foods for 18 and 24 months, respectively. For all stability time points, each lot was analyzed in duplicate for total

lutein. Each stability sample was saponified prior to lutein analysis to remove fatty acids that interfere with HPLC analysis (method included in Appendix 11), so that lutein was measured in "free form" for both products. The results of the stability study for lutein in the dry and wet diets are summarized in Tables 2-14 and 2-15, and the linear regressions for each lot tested are shown in Figures 2-4 and 2-5.

Table 2-14 Stability Results for Lutein in Dry Pet Food at Long-term Conditions

Total Lutein (µg/g or ppm)	Test Interval (Months)							
	0	1	3	6	9	12	15	18
Lot 1	12.29 ± 0.11	(b) (4)						
Lot 2	10.93 ± 0.27							
Lot 3	10.49 ± 0.41							

Figure 2-4 Linear Regression Analysis for Lutein in Dry Pet Food

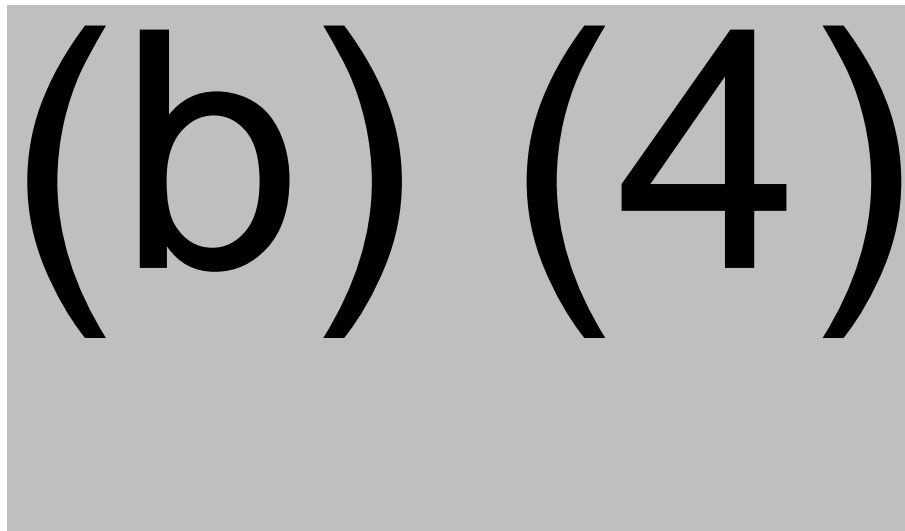
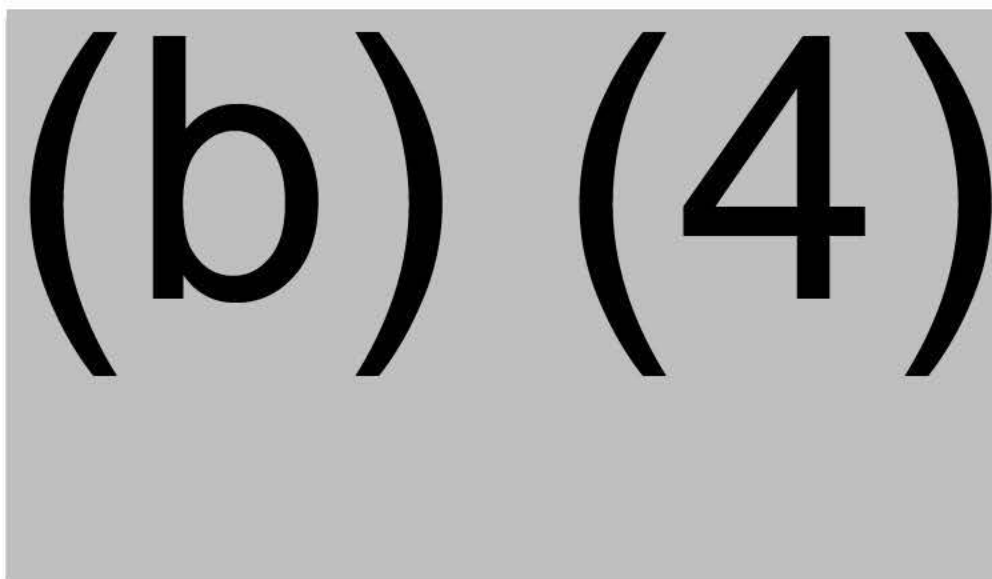


Table 2-15 Stability Results for Lutein in Wet Pet Food at Long-term Conditions

Total Lutein (µg/g or ppm)	Test Interval (Months)								
	0	1	3	6	9	12	15	18	24
Lot 1	3.24 ± 0.22	(b) (4)							
Lot 2	3.52 ± 0.2								
Lot 3	3.32 ± 0.11								

Figure 2-5 Linear Regression Analysis for Lutein in Wet Pet Food



The results of the lutein analysis demonstrate that marigold extract remained stable over the duration of the study in finished pet food. This was regardless of diet type (i.e., wet or dry) and in the most unfavorable conditions for each chemical form of lutein. The raw stability data for both dry and wet are included in Appendix 8.

2.4.3. Marigold Extract Homogeneity in Finished Product

The homogeneity of marigold extract in both dry and wet pet food was assessed by measuring lutein from 3 independent lots per diet type, with a total of at least 10 samples for each lot collected at filling/packaging covering the beginning, middle, and end of production. The lutein concentration for each sample was measured in duplicate then averaged over the collected samples per lot and the coefficient of variation (CV) was calculated. Results from the homogeneity study for both dry and wet pet food are summarized in Tables 2-16 and 2-17.

Table 2-16 Results of Homogeneity for Lutein in Dry Pet Food

Sample	Total Lutein (µg/g or ppm)
1	(b) (4)
2	
3	
4	

5	(b) (4)		
6			
7			
8			
9			
10			
11			
12			
13			
Avg. Total Lutein (µg/g or ppm)	21.54	19.83	17.95
St. Dev.	0.71	0.65	0.36
CV (%)	3.30	3.28	2.0

Table 2-17 Results of Homogeneity for Lutein in Wet Pet Food

Sample	Total Lutein (µg/g or ppm)		
	1	(b) (4)	
2			
3			
4			
5			
6			
7			
8			
9			
10			
Avg. Total Lutein (µg/g or ppm)	2.86	2.26	2.68
St. Dev.	0.31	0.31	0.26
CV (%)	10.95	13.72	9.67

The coefficient of variation (CV) is a statistical measure of the extent of variability in relation to the mean or average for a given parameter. It is calculated using the following formula:

$$CV(\%) = \frac{\text{Standard Deviation}}{\text{Mean}} \times 100$$

The homogeneity results for both dry and wet pet food clearly indicate that the CVs for all tested batches is low (<14%), demonstrating a high degree of consistency and uniformity in the incorporation of marigold extract into the final product. This holds true even when accounting for potential analytical method variability and the overall batch size typical in commercial pet food production. The increased CV observed in the wet diets is expected, given the lower adjusted inclusion level, which accounts for the difference in caloric density between wet and dry foods. A lower inclusion level amplifies the impact of sample variation

and the challenges of sampling within a viscous matrix, resulting in a higher calculated CV. The raw homogeneity data for both dry and wet diets are provided in Appendix 9.

2.5. Analytical Methods

Many of the analytical methods used in raw material characterization, release and contaminant testing are compendial with references listed for each. The analytical methods specific to xanthophyll quantification in the raw material have been adopted from the following references summarized in Table 2-18, which are currently used by both suppliers. The HPLC method for lutein and zeaxanthin quantification, which is specific to (b) (4) is also referenced in Table 2-18, along with the method presented in Appendix 10.

Table 2-18 Overview of Analytical Methods for Xanthophyll and Lutein Quantification in Marigold Extract

Parameter	Method Reference
Determination of Xanthophyll in Marigold Extract	AOAC, 1974. Carotenes and Xanthophylls in Dried Plant Materials and Mixed Feeds: Spectrophotometric Method. <i>AOAC Official Methods</i> , 970.64. FAO and WHO. 2018. Compendium of Food Additive Specifications. Joint FAO/WHO expert Committee on Food Additives (JECFA), 86 th meeting 2018. FAO JECFA Monographs 22. Lutein from <i>Tagetes erecta</i>
Determination of Lutein in Marigold Extract	Determination of Carotenoid Profile in Saponified and Unsaponified Products from Marigold (Appendix 10)

(b) (4)

2.6. Intended Use

In accordance with 21 CFR §570.230(d), when necessary to demonstrate safety, relevant data and information bearing on the physical or other technical effect the notified substance is intended to produce, including the quantity of the notified substance required to produce such an effect, should be included. The intended use of marigold extract as a nutritive antioxidant has no bearing on the safety of the ingredient, and thus the requirement for supporting data to demonstrate intended use is not necessary. There are several well-established antioxidants readily used in pet food, including carotenoids, alpha-lipoic acid, vitamin C, vitamin E, citric acid, and minerals such as selenium. Marigold extract with its antioxidant properties augments the effects of other antioxidants to reduce oxidative stress, yet the outcome is not solely dependent on marigold extract alone.

As noted earlier, lutein is the main active component in marigold extract that contributes to its antioxidant properties. Lutein can only be obtained systemically in companion animals through diet or supplementation. The chemical structure of lutein is composed of a long carbon chain with alternating single and double bond bonds with attached methyl groups, the main chain is attached to cyclic end groups (one β - and one ϵ -ionone ring) with a hydroxyl group on each ring (see Figure 2-2). The antioxidant nature of lutein can be attributed to its distinct chemical structure. The conjugated double bonds and hydroxyl end groups are susceptible to oxidation by donating electrons to free radicals, thereby minimizing their oxidative damage *in vivo* through chemical stabilization (Ahn et al., 2021). Reactive oxygen species (ROS) have been associated with a variety of alterations in biological processes, including lipid peroxidation in cell membranes, which can lead to membrane rupture, and DNA or RNA damage/cleavage, which causes cellular mutations associated with a variety of disease states (Russo et al., 2016 and Dowling et al., 2012). The biological effects of oxidative damage are a universal issue that are experienced by numerous species, including cats and dogs (Karadeniz et al., 2008, Forterre et al., 2012, Tecles et al., 2015, Fan et al. 2023, and Kamoshita et al. 2016). This occurs when there is a disparity between free radical production and endogenous antioxidant levels, necessitating the need to further increase antioxidant levels through diet.

The body of research in humans supporting the antioxidant properties of lutein in protecting against conditions driven by oxidative damage is vast, with particularly strong evidence for its role in safeguarding against eye-related disorders like age-related macular degeneration and cataracts (Johnson, 2004; Mares, 2016; Mitra et al., 2021). The same antioxidant properties observed in human studies have been demonstrated in companion animals when used in conjunction with other antioxidants commonly found in pet food. In a study evaluating the effects of oxidative damage caused by prolonged exercise in sled dogs, the treatment group was fed a dietary supplement containing 400 IU of α -tocopherol, 3 mg of β -carotene, and 20 mg of lutein daily for one month prior to the start of the study. The treatment group exhibited an increase in lipoprotein resistance to oxidation and a decrease in DNA oxidative damage following prolonged exercise, accompanied by a significant elevation in plasma antioxidant concentrations in comparison to the control group (Baskin et al., 2000). A six-month controlled, randomized trial was conducted to evaluate the effect of antioxidants on canine vision in 12 beagles with healthy ocular function. The subjects were randomly assigned to receive either a control or antioxidant supplement (lutein 20 mg, zeaxanthin 5 mg, β -carotene 20 mg, astaxanthin 5 mg, vitamin C 180 mg, and vitamin E 336 mg per day) daily. The results of the study demonstrated that antioxidant supplementation significantly improved retinal responses in both dark and light conditions, and further reduced the decline in refractive error that commonly occurs with aging compared to controls (Wang et al., 2016).

The presented examples, in conjunction with the extensive literature available, substantiate the antioxidant properties of lutein. This evidence supports the use of marigold extract as a nutritional antioxidant up to 80 mg/kg lutein in cat and dog foods. Nevertheless, in accordance with 21 CFR 570.230(d), a demonstration of utility of the GRAS substance is not required because the intended use of marigold extract as a nutritional antioxidant is not related to or affects safety.

3. §570.235 Part 3: Target Animal and Human Exposures

3.1. Exposure through Supplementation of Cat and Dog Food

Marigold extract added to complete feed for cats and dogs at an inclusion level intended to supply between 20 to 80 mg/kg lutein on a dry matter basis will result in the following exposure scenarios for adult dogs, cats and kittens. Exposure for puppies is based on the typical use level of 20 mg/kg. (Tables 3-1 to 3-3).

To simplify the examples, inclusions are on a dry matter (DM) basis in diets that deliver 4000 kcal/kg DM. Consequently, though concentrations will be different on an *as fed* basis for wet versus dry diets, animal exposure to lutein and marigold extract from the formulated ingredient in mg/kg bw/day will be the same. Only the exposure to lutein and the marigold oleoresin (extract) are considered as the other components of the food products, are already approved ingredients for pet food.

The maximum use level of 80 mg/kg lutein was chosen to comply with the NRC derived presumed safe intake (PSI) for lutein of 1.8 mg/kg bw/day (NRC, 2009) in adult dogs. This level will be protective of cats as well as the cat PSI is higher (7.1 mg/kg bw/day). As this maximum use level is already four times the typical use level, it is unnecessary to establish a different, higher maximum for cats. For puppies, the maximum use level would exceed the NRC PSI for dogs so only the typical use level is considered in exposure tables. However, up to 28 mg/kg lutein in puppy food would result in exposures compliant to the PSI. It should be noted that the PSIs were derived from the highest dose studied in each species and the lower PSI for dogs is not a consequence of reported adverse effects for dogs. (Kim, 2000a,b). No adverse effects have been described in either dogs or cats at the highest doses tested, so the maximum use level is likely conservative. Exposures for puppies and kittens will be higher due to higher consumption, but as this time-limited and no developmental adverse effects have been reported in any species, this is not a risk. Additionally, the NOAEL in rats is about 195 mg/kg bw/day from which JECFA derived an acceptable daily intake (ADI) for humans of 2.0 mg/kg bw/day by applying the standard toxicological uncertainty factors of 10 for interspecies and 10 for intraspecies (Kruger, 2002). All studies are described below in the safety narrative. The *typical* use level in finished pet food is expected to be about 20 mg/kg lutein.

Energy requirements to determine food intake were calculated based on *NRC 2006 Nutrient Requirements of Dogs and Cats* equations as shown below. Actual bodyweights (BW_a) and expected mature bodyweights (BW_m) were selected to represent worst case exposures and, for dogs, the range of exposures.

Table 3-1 Estimated Daily Intake Levels Calculations

Animal	ME (kcal) =
Kennel Dogs	130 X BW _a ^{0.75}
Lean Cats	100 X BW _a ^{0.67}
Puppies	130 X BW _a ^{0.75} X 3.2 X [e ^(-0.87p) - 0.1], where: P = BW _a /BW _m
Kittens	100 X BW _a ^{0.67} X 6.7 X [e ^(-0.187p) - 0.66], where: P = BW _a /BW _m and e=base natural log

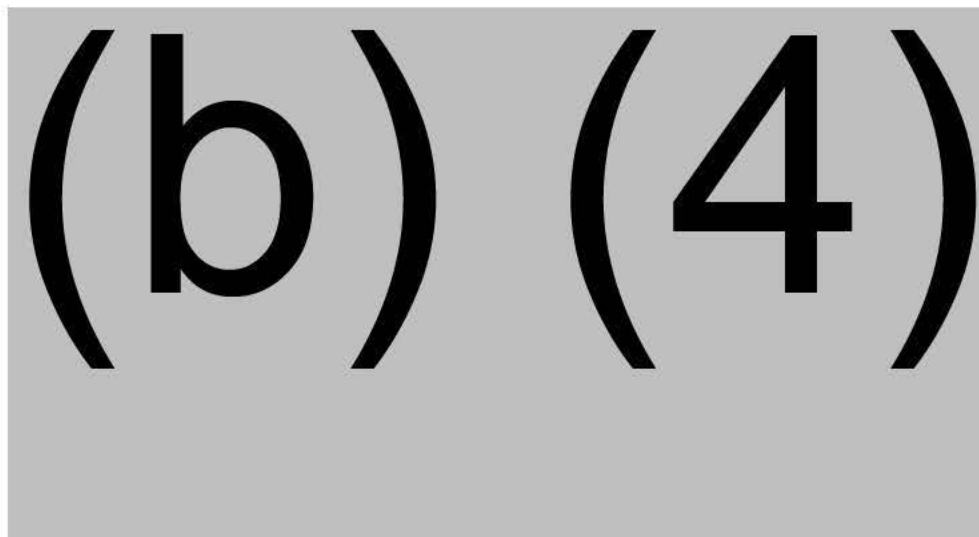
Scenario 1: (b) (4) containing (b) (4) to deliver 20 mg/kg (typical) (maximum) DM lutein in finished pet food ((b) (4) specification is on total xanthophylls, so a worst case is assumed in which only 70% of the xanthophylls is lutein and the maximum inclusion of (b) (4) from Table 2-4 is used in the formulated product.)

Table 3-2 Estimated Daily Intake Levels for (b) (4)

Weight *	Food, DM	Lutein		Marigold Extract (Oleoresin)	
		Typical	Maximum	Typical	Maximum
[kg]	[g/Day]	[mg/kg BW/day]		[mg/kg BW/day]	
Adult Dogs					
5	108.7	0.43	1.74	4.23	16.9
50	611.1	0.24	0.98	2.38	9.51
Adult Cats					
4	63.3	0.32	1.27	3.08	12.3
Puppies					
1.5 (5)	94.5	1.26		12.2	
17 (35)	483.6	0.57		5.53	
Kittens					
0.8 (4)	44.0	1.10	4.40	10.7	42.7

*Expected adult weight is given in parentheses for puppies and kittens

Sample Calculation:



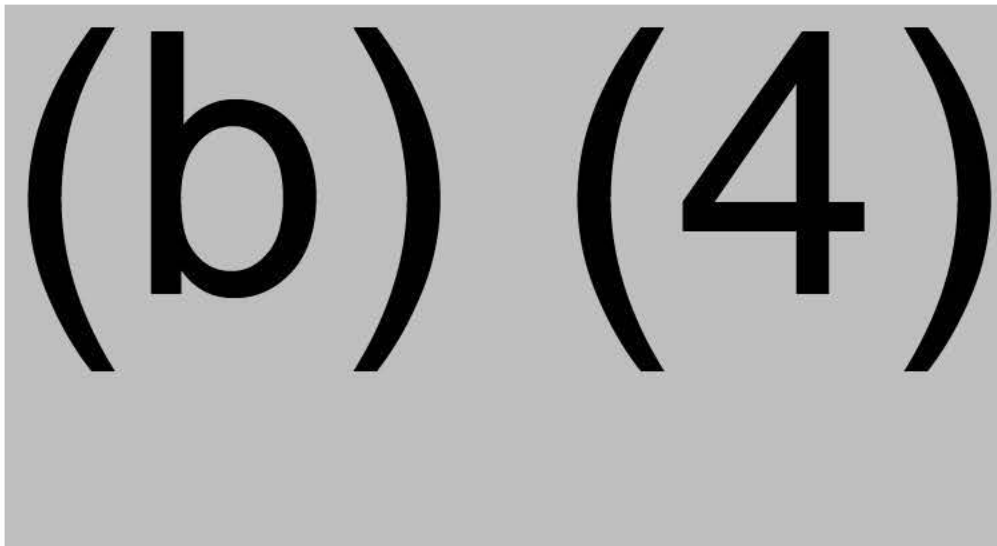
Scenario 2: (b) (4) containing (b) (4) to deliver **20 mg/kg** (typical) or **80 mg/kg** (maximum) DM lutein in finished pet food. (Worst case assumption from specification, 80% lutein in 20.0 g/kg xanthophylls, and maximum inclusion of oleoresin from Table 2-5)

Table 3-3 Estimated Daily Intake Levels for (b) (4)

Weight *	Food, DM	Lutein		Marigold Extract (Oleoresin)	
		Typical	Maximum	Typical	Maximum
[kg]	[g/Day]	[mg/kg BW/day]		[mg/kg BW/day]	
Adult Dogs					
5	108.7	0.43	1.74	4.78	19.1
50	611.1	0.24	0.98	2.69	10.76
Adult Cats					
4	63.3	0.32	1.27	3.48	13.9
Puppies					
1.5 (5)	94.5	1.26		13.9	
17 (35)	483.6	0.57		6.26	
Kittens					
0.8 (4)	44.0	1.10	4.40	12.09	48.4

*Expected adult weight is given in parentheses for puppies and kittens

Sample Calculation:



4. §570.240 Part 4: Self-Limiting Levels of Use

There are no known self-limiting levels for the use of marigold extract.

5. §570.245 Part 5: Experience Based on Common Use in Food Before 1958

Not Applicable

6. §570.250 Part 6: Narrative

6.1. Introduction

Lutein and lutein esters from hexane extracts of marigold (*Tagetes erecta*) are widely used in human food as a nutrient supplement and as a color additive. Some applications include baked goods, beverages, breakfast cereals, chewing gum, dairy substitutes and infant and toddler foods. Inclusion levels range from 2 to 330 mg/kg (JECFA, 2006). Nine GRAS notifications for various forms and intended uses of marigold extract have been evaluated by the FDA with no questions as shown in Table 6-1 below.

Table 6-1 Summary of Human Food GRAS Dossiers containing Lutein or Lutein Esters

	GRN 110	GRN 140	GRN 221	GRN 291	GRN 291	GRN 385	GRN 390	GRN 432
Form	Lutein Ester	Crystalline Lutein	Suspended Lutein	Crystalline Lutein	Crystalline Lutein	Crystalline Lutein, zeaxanthin enriched	Suspended Lutein	Lutein Diacetate
Intended Use	Food and Beverages	Food and Beverages	Term Infant Formula	Food and Beverages	Food and Beverages	Food and Beverages	Pre-term Infant Formula	Food and Beverages not under USDA Jurisdiction

The difference between the marigold extracts used in human foods and supplements and those under consideration here is that the human food additives are subjected to an additional purification step which removes free fatty acids and other non-carotenoid plant components. The purified extracts typically contain about 60 - 80% carotenoid or carotenoid esters (JECFA, 2006, GRAS documents), as compared to 13 - 16% for the extracts under consideration (see Table 2-3 above). The carotenoid fraction of both the purified and non-purified extracts consist primarily of lutein and zeaxanthin (collectively xanthophylls).

The available toxicological studies on the safety of lutein from marigold extracts, including those used to derive the PSIs for dogs and cats and the ADI for humans, use the purified hexane extracts as the test substance. As mentioned, the purified extract is substantially higher in lutein and zeaxanthin than the ingredients which are the subject of this dossier. However, the purified extracts still contain up to about 20% of the non-xanthophyll (NX) plant matter. Evaporation of the hexane extract of marigold flowers results in lutein, lutein esters, other carotenoids, triglycerides and other lipid-soluble esters and waxes. To obtain free lutein, the hexane extract is saponified with an alkali solution. In the purified versions, the extract is mixed with a polar solvent such as ethanol and heated under vacuum to remove free fatty acids and other alcohol soluble impurities.

In the unpurified ingredient, free fatty acids remain. These are fatty acids which are commonly found in feed ingredients and pose no risk to dogs and cats. Also remaining are other residual plant materials, referred to above as the NX portion which also occur in the purified versions. Consequently, as the free fatty acids do not impact animal health and the NX portion occurs in both the test material used in the toxicological studies and the ingredients under consideration, these existing studies are appropriate for establishing safety.

Similarly, as with supplements for humans, there is no difference in safety between extracts providing free lutein and the esterified form. The chemical distinction between lutein esters and free lutein is diminished during the process of gastrointestinal (GI) absorption. This is due to the susceptibility of the ester bonds linking the fatty acids to the hydroxyl end-groups to degradation through both enzymatic and water hydrolysis. In vivo, free lutein is the primary active compound of interest in either supplied form of marigold extract, due to the hydrolysis of lutein esters prior to or during systemic uptake. Upon oral administration, the hydrolysis of lutein esters to free lutein has been demonstrated in multiple species, including rats (Zhang et al., 2007) and humans (Norkus et al., 2010). In these studies, only free lutein could be detected by HPLC in blood or serum samples.

Esterases, and in particular lipases (a type of esterase that cleaves esters with long-chain fatty acids) belonging to the carboxylesterase superfamily, have been identified as the principal enzymes involved in the enzymatic hydrolysis of carotenoid esters (such as lutein esters) during GI absorption. In a simulated digestion model evaluating the hydrolysis of zeaxanthin esters (structurally similar to lutein esters), carboxyl ester lipase (CEL) demonstrated a specificity for hydrolyzing the ester linkage that other lipases lacked (Chitchumroonchokchai et al., 2006). Similarly, other research has indicated that CEL is capable of hydrolyzing esterified forms of lutein, capsanthin, and β -cryptoxanthin (Breithaupt et al., 2002). CEL is a commonly occurring lipase, typically secreted from the pancreas. The enzyme has been identified in the digestive tract of cats and dogs (Seligman et al., 1949; Abouakil et al., 1988; Lim et al., 2022) as well as in milk secretions (Freed et al., 1986; Wang et al., 1989). It is not anticipated that the functional form of lutein (free) will vary systemically in cats or dogs based on the presence or similarity of enzymes responsible for ester hydrolysis, as observed in other species.

The NRC Presumed Safe Intakes (PSIs) are used to demonstrate a margin of safety for the active components keeping in mind that no adverse effects were reported, and the true upper limit is likely higher. The pivotal rodent study used to derive the human ADI as well as the dog and cat studies from which the PSIs are derived are described below. Two additional studies are also described. One study conducted on rodents demonstrates no significant difference in safety between lutein and lutein esters, establishing a higher No Observed Adverse Effect Level (NOAEL). The second, more recent study involving dogs indicates that a substantially higher dose of lutein can be administered without any adverse effects.

The pivotal study identified by JECFA was a 13-week toxicity study conducted according to OECD Test Guideline 408. Han Wistar rats (10/sex/dose) were fed a high lutein marigold extract in food at 0, 2.6, 26 and 260 mg/kg bw/day. Five animals from the control and five from the highest dose tested were allowed a 4-week recovery period prior to necropsy. The remainder were necropsied immediately following the treatment period. No clinical symptoms or changes to hematology, clinical chemistry or histopathology were observed. The only death was attributable to blood sampling. The highest dose of 260 mg/kg bw/day was identified as the NOEL. The NOEL for lutein from this study is about 195 mg/kg bw/day based on a concentration of 75% in the extract. A safety factor of 100 was applied to arrive at the ADI of 2 mg/kg bw/day for humans. The NOEL for the NX portion in this study would have been about 52 mg/kg bw/day (Kruger, et al., 2002).

Subsequent to the JECFA evaluation, which was completed in 2006, another 13-week study was published in 2008 in which both free lutein and lutein esters from *T. erecta* were evaluated. In this study, hexane was used to extract lutein esters. Free lutein was obtained following saponification and crystallization.

Wistar rats (5/sex/dose) were given 4, 40 or 400 mg/kg bw/day lutein or lutein esters isolated from marigold flowers by hexane extraction (85% purity) and dissolved in sunflower oil. Molar equivalents of the ester were given to arrive at the same lutein doses as given in the free lutein groups. A control group was given

sunflower oil only. Doses were administered via oral gavage for 13 weeks. Body weight, body weight gain, food intake and mortality were not affected by either the ester or the free lutein. No clinical signs of toxicity were observed. No changes in organs or weight of lungs, spleen or kidneys were observed. Incidental and inconsistent changes in liver, thymus and eyes were seen in males only and did not have toxicological significance. Blood urea and serum creatinine tests did not show treatment-related changes. There were no significant changes in serum sodium, potassium, chloride or bicarbonate that would indicate a change in renal function.

No significant changes were observed in hepatic function including serum ALT, alkaline phosphatase, total bilirubin or albumin/globulin ration. A slight decrease in AST was observed in males receiving 400 mg/kg bw/day lutein ester and females receiving 40 or 400 mg/kg bw/day lutein. There was no change in cholesterol, triglycerides, HDL cholesterol, LDL cholesterol, or VLDL cholesterol. No changes in RBC count, platelet count, hemoglobin levels, white blood count or lymphocyte count occurred. Histopathological analysis of brain, spleen, kidney, liver and eyes showed no pathological lesions. The authors concluded that neither lutein or lutein esters produced any toxicity at up to 400 mg/kg bw/day lutein (Harikumar, 2008). The expected exposure to the NX portion of the extract would have been about 78.5 mg/kg bw/day (estimated by using the stated purity of 85% as the xanthophyll content and assuming that lutein is 90% of the xanthophylls so that 400 mg/kg bw lutein is provided in 523 mg/kg bw extract of which 78.5 mg/kg bw/day would have been the NX portion).

A recent study explored the potential benefits of lutein supplementation in the Indian leopard (*Panthera fusca*), a wild cat species that, like the domestic cat, belongs to the Felidae family, to assess its impact on antioxidant status, immune function, and stress in captive animals. Captive Indian leopards, typically fed carabeef on bone (CBB) diets, lack carotenoids—compounds that their wild counterparts obtain from natural prey. In a controlled experiment using a 3×3 replicated Latin square design, nine adult leopards (5 male, 4 female) were supplemented with 0, 20, or 40 ppm of lutein, with all leopards receiving diets containing each of the three treatments sequentially. Lutein supplementation at 20 ppm significantly enhanced antioxidant status and immune function, increasing serum protein, globulin, and carotenoid levels, while alleviating stress markers through notable reductions in malondialdehyde (MDA) and fecal cortisol concentrations. Additionally, supplementation improved crude protein digestibility and increased lymphocyte transformation test (LTT) index and immunoglobulin levels. Overall, lutein supplementation at 20 ppm optimally compensates for carotenoid deficiencies in captive Indian leopards, enhancing immunity, reducing stress, and improving overall health (Durge et al., 2022).

6.2. Target Animal Studies

Female cats were fed supplemental lutein from marigold extract at doses of 0, 0.71, 3.54 or 7.09 mg/kg bw/day for twelve weeks (14 cats/dose). Though designed to evaluate immune effects of dietary lutein rather than to directly assess safety, no significant change in body weight or other adverse effects were observed in this study. NRC used this study to conclude the PSI for cats of lutein is 7.2 mg/kg bw/day. Modulation of cell-mediated and humoral immune responses were considered beneficial. Exposure to the NX material from the marigold extract at the highest dose was calculated to be 1.68 mg/kg bw/day based on the reported concentration of 81.89% of lutein and zeaxanthin combined (18.11% NX) (Kim, et al., 2000a).

In a similar study, the same authors fed dogs supplemental lutein from marigold extract to dogs at doses of 0, 0.44, 0.91 and 1.82 mg/kg bw/day for twelve weeks. As with the cat study, immune effects were the

primary purpose of the study. However, bodyweight was unchanged, and no adverse effects were reported. Enhanced cell-mediated and humoral responses were considered beneficial. NRC used this study to conclude the PSI for dogs of lutein is 1.8 mg/kg bw/day. At the highest dose, exposure to the NX material in the extract was 0.41 mg/kg bw/day (Kim, et al., 2000b).

In a study published since the NRC review, dogs were fed a substantially higher dose of marigold extract. Beagles were fed a dry diet with 0 or 45 g/kg xanthophylls from marigold extract (75% lutein, 2% zeaxanthin) for 120 days (4 dogs/sex/dose). Each dog was given an amount of food to provide metabolizable energy according to the NRC 2006 equation of $130 \times BW^{0.75}$ kcal/day. With an average body weight of 9.2 ± 1.2 kg, the lutein dose would have been between 620 and 670 mg/kg bw/day. The exposure to the NX portion of marigold extract would have been between 190 and 200 mg/kg bw/day. No differences were reported between the control and treatment groups for blood parameters, digestibility or lymphocyte proliferation. The group receiving lutein-supplemented diets did have differences in lymphocyte differential counts, showing increased CD4+ and CD8+ subtypes. This is considered a beneficial immunomodulatory effect (Alarça, et al., 2016).

The following table summarizes the exposure to lutein and the remaining components of the extract (NX) components in the studies discussed.

Table 6-2 Summary of Animal Studies used to Define Lutein Safety

Study	Species	Exposure (mg/kg bw/day)		
		Marigold Extract	Lutein	Non-Xanthophyll (NX)
Kruger, 2002	Rat	260	195	52
Harikumar, 2008	Rat	523	400	~78.5
Kim, 2000a	Cat	9.3	7.1	1.7
Kim, 2000b	Dog	2.3	1.8	0.4
Alarça, 2016	Dog	1025	620	190

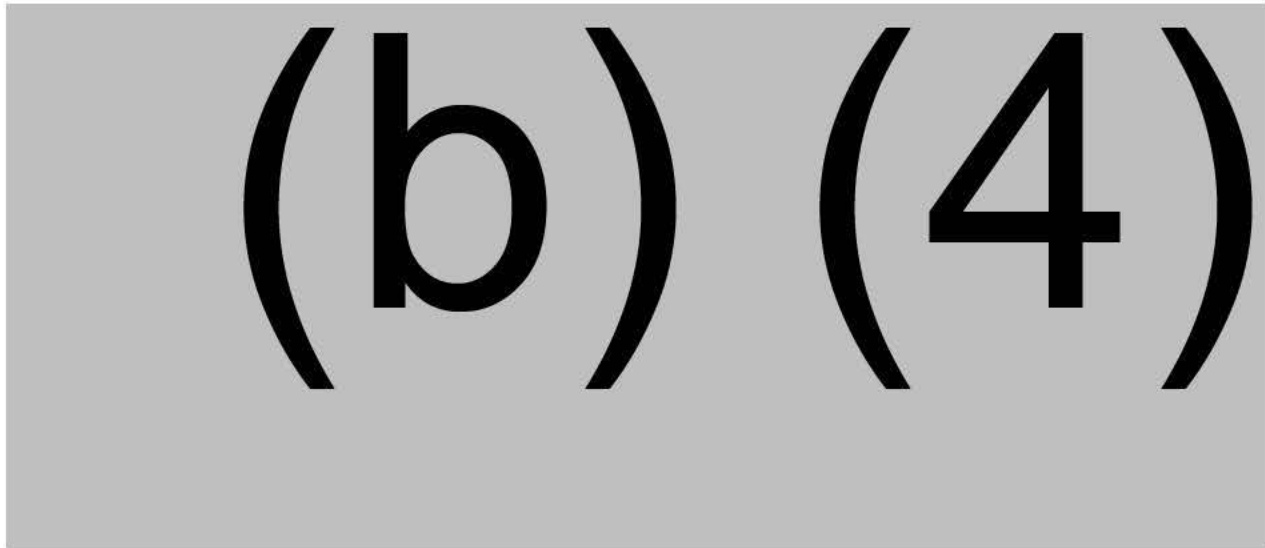
Given the analytical data shared in Table 2-3, exposure to the NX portion of the marigold extract (oleoresin) can be calculated for comparison. For example, (b) (4) has the following composition and resulting finished product inclusions. For simplicity, carrier and antioxidant ingredients have been omitted. This table reflects the average of the analytical results for the oleoresin and the formulated ingredient (see Table 2-7) which explains the slight variation from the reported composition shown in table 2-5. Use of analytical data allows for the calculation of the NX portion, which is the oleoresin minus xanthophylls, fatty acids and water.

Table 6-3 Summary of the Compositional Results (Average) and Inclusion for (b) (4)

% of Raw Material	Component	Inclusion in Finished Pet Food (mg/kg), DM basis	
		Typical	Maximum
100	(b) (4)	1250	5000
14.79	Oleoresin	184.8	739.3

1.97	Xanthophylls	24.6	98.3
1.84	Lutein	23.0	91.9
0.13	Zeaxanthin	1.6	6.4
4.33	Fatty Acids	54.1	216.4
2.45	Water	30.7	122.6
6.04	NX	75.5	302.0

Sample Calculation:



The resulting exposure to dogs and cats for each component at the maximum use level is shown below.

Table 6-4 Cat and Dog Exposure Summary for Components Contained in Marigold Extract (e.g. (b) (4))

Weight [kg]	Food, DM [g/Day]	(b) (4)	Marigold Extract (Oleoresin)	Xanthophylls [mg/kg bw/day]	Fatty Acids	Moisture	NX
Adult Dogs							
5	108.7	108.67	16.07	2.14	4.70	2.66	6.56
50	611.1	61.11	9.04	1.20	2.64	1.50	3.69
Adult Cats							
4	63.3	79.11	11.70	1.56	3.42	1.94	4.78
Puppies*							
1.5	94.5						
17	483.6						
Kittens							

0.8	44.0	274.72	40.62	5.40	11.89	6.74	16.59
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* For 1.5 kg puppies exposures (mg/kg bw/day) at the typical use level of 20 mg/kg lutein are: (b) (4)

(b) (4)

The highest expected NX exposure from the use of the ingredients under consideration at the maximum use level is 19.02 mg/kg bw/day for small breed puppies. Exposures are similar for (b) (4). Given that this worst case provides greater than a 2X margin of exposure compared to the pivotal rodent study, adverse effects are not expected. At the typical use level, the smallest puppies are only exposed to 4.76 mg/kg bw/day of the NX portion. Consequently, the safety studies using purified marigold extracts are appropriate to establish the safety of the ingredients under consideration.

Additionally, one study in cats and two in dogs support the safety of marigold extract for the target species.

The animal studies presented here demonstrate the safety of lutein and lutein esters from marigold extract in multiple species. In each study, the highest dose tested represents the NOAEL, confirming that no adverse effects were identified. The test substance in these studies differs from the materials under consideration only in regard to the incomplete removal of free fatty acids and other plant materials. The maximum proposed use level for the materials, which are the subject of this dossier, still provides a reasonable margin of exposure for these remaining compounds (the NX portion) compared to the highest doses in the animal studies. The same animal studies have been evaluated by FDA in various GRAS applications and no questions were raised for use in human foods and infant formulas. This combined with target species studies in dogs and cats for which no adverse effects were reported, is clear evidence of the safety of the materials under consideration for use at the proposed levels in food for dogs and cats.

As demonstrated, there are no indications that adverse effects to dogs or cats would result from the consumption of hexane extracts of the flowers of *T. Erecta*, either saponified (“free”) or esterified and meeting the specifications described herein, when used at the proposed use levels to provide dietary lutein up to 80 mg/1000 kcal metabolizable energy. In accordance with the Federal Food, Drug, and Cosmetic Act (“FD&C Act”) and its implementing regulations as administered by the U.S. Food and Drug Administration (FDA), we have determined there is a reasonable basis to conclude that this intended use is generally recognized as safe (GRAS). Thus, it may be properly concluded that marigold extract is exempt from the premarket approval requirements of the FD&C Act, and as a GRAS substance, marigold extract may be used as intended in dog or cat food at the proposed use levels in compliance with the FD&C Act and all applicable regulations.

7. §570.250 Part 7: List of Supporting Data and Information

7.1. List of Appendices

The following appendices listed 1, 5A-C, 10, and 11 are deemed confidential as noted in the list below.

- Appendix 1: Laboratory Report – (b) (4)[®] Marigold Oleoresin Composition
(CONFIDENTIAL)
- Appendix 2: Laboratory Report – (b) (4) Marigold Oleoresin Composition
- Appendix 3A: Certificate of Analysis (b) (4)[®] Lot (b) (4)
- Appendix 3B: Certificate of Analysis (b) (4) Lot (b) (4)
- Appendix 3C: Certificate of Analysis (b) (4)[®] Lot (b) (4)
- Appendix 4A: Certificate of Analysis (b) (4) Lot (b) (4)
- Appendix 4B: Certificate of Analysis (b) (4) Lot (b) (4)
- Appendix 4C: Certificate of Analysis (b) (4) Lot (b) (4)
- Appendix 5A: Certificate of Analysis (b) (4) Lot (b) (4) (Contaminants)
(CONFIDENTIAL)
- Appendix 5B: Certificate of Analysis (b) (4) Lot (b) (4) (Contaminants)
(CONFIDENTIAL)
- Appendix 5C: Certificate of Analysis (b) (4) Lot (b) (4) (Contaminants)
(CONFIDENTIAL)
- Appendix 6A: Certificate of Analysis (b) (4) (Heavy Metals)
- Appendix 6B: Certificate of Analysis (b) (4) (Residual Solvents)
- Appendix 6C: Certificate of Analysis (b) (4) (Dioxins and PCBs)
- Appendix 6D: Certificate of Analysis (b) (4) (Microbiology)
- Appendix 7A: Raw Material Shelf-life Summary – (b) (4)
- Appendix 7B: Raw Material Shelf-life Summary – (b) (4)
- Appendix 8A: Finished Product Dry Stability Data
- Appendix 8B: Finished Product Wet Stability Data
- Appendix 9A: Finished Product Dry Homogeneity Data
- Appendix 9B: Finished Product Wet Homogeneity Data
- Appendix 10: Determination of Carotenoid Profile in Saponified and Unsaponified Product for Marigold
(b) (4) Method) (CONFIDENTIAL)
- Appendix 11: Analytical Method Validation for Determination of Lutein in Finished Product
(CONFIDENTIAL)
- Appendix 12: GRAS Panel Statement on the GRAS Conclusion for the Proposed Use of Marigold Extract
in Food for Dog and Cats

7.2. List of Abbreviations

AAFCO	Association of American Feed Control Officials
ADI	Acceptable Daily Intake
ATSDR	Agency for Toxic Substances and Disease Registry
BW _a	Actual Bodyweights
BW _m	Mature Bodyweights
CAS	Chemical Abstracts Service Number
CBB	Carabeef on Bone
CEL	Carboxyl Ester Lipase

CV	Coefficient of Variation
DM	Dry Matter
GI	Gastrointestinal
GRAS	Generally Recognized as Safe
HPLC	High Performance Liquid Chromatography
IUPAC	International Union of Pure and Applied Chemistry
LTT	Lymphocyte Transformation Test
MDA	Malondialdehyde
NOAEL	No Observed Adverse Effect Level
NOEL	No Observed Effect Level
NX	Non-Xanthophyll
OP	AAFCO Official Publication
PCBs	Polychlorinated Biphenyls
PSI	Presumed Safe Intake
ROS	Reactive Oxygen Species

Note: Each abbreviation is fully defined the first time it appears in the text, followed by the abbreviation in parentheses. Subsequently, only the abbreviation is used throughout the rest of the text.

7.3. References

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(b) (4)

(b) (4), (b) (6)

(b) (4), (b) (6)

Client Code: JD0000644
PO#: SW

ANALYTICAL REPORT

AR-24-JD-066110-01

Received On: 29Jul2024
Reported On: 12Aug2024

(b) (4):	473-2024-07290286	Sample Registration Date:	29Jul2024
Client Sample Code:	2302104949	Condition Upon Receipt:	acceptable, 23.4°C
Sample Description:	Marigold oleoresin	Sample Reference:	RM01279

QD05C - Fatty Acids-Full Omega 9,6&3 & Trans %W/W	Reference AOAC 996.06 mod.	Accreditation	Completed 12Aug2024	Sub 1
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Parameter	Result
Fatty Acid Profile	Reported as Fatty Acids
C4:0 (Butyric Acid)	(b) (4)
C6:0 (Caproic acid)	
C8:0 (Caprylic acid)	
C10:0 (Capric acid)	
C11:0 (Undecanoic acid)	
C12:0 (Lauric Acid)	
C14:0 (Myristic acid)	
C14:1 (Myristoleic acid)	
C15:0 (Pentadecanoic acid)	
C15:1 (Pentadecenoic acid)	
C16:0 (Palmitic Acid)	
C16:1 Omega 7	
C16:1 Total (Palmitoleic Acid + isomers)	
C16:2 (Hexadecadienoic Acid)	
C16:3 (Hexadecatrienoic Acid)	
C 16:4 (Hexadecatetraenoic Acid)	
C17:0 (Margaric Acid)	
C17:1 (Heptadecenoic Acid)	
C18:0 (Stearic Acid)	
C18:1 (Vaccenic acid)	
C18:1 Omega 9 (Oleic Acid)	
C18:1, Total (Oleic Acid + isomers)	
C18:2 Omega 6 (Linoleic Acid)	
C18:2, Total (Linoleic Acid + isomers)	
C18:3 Omega 3 (Alpha Linolenic Acid)	

(b) (4), (b) (6)

Client Code: JD0000644
PO#: SW

ANALYTICAL REPORT

AR-24-JD-066110-01

Received On: 29Jul2024
Reported On: 12Aug2024

(b) (4):	473-2024-07290286	Sample Registration Date:	29Jul2024
Client Sample Code:	2302104949	Condition Upon Receipt:	acceptable, 23.4°C
Sample Description:	Marigold oleoresin	Sample Reference:	RM01279

QD05C - Fatty Acids-Full Omega 9,6&3 & Reference	Accreditation	Completed	Sub
Trans %W/W	AOAC 996.06 mod.	12Aug2024	1

Parameter	Result
C18:3 Omega 6 (Gamma Linolenic Acid)	(b) (4)
C18:3, Total (Linolenic Acid + isomers)	
C18:4 Omega 3 (Octadecatetraenoic Acid)	
C18:4 Total (Octadecatetraenoic Acid)	
C20:0 (Arachidic Acid)	
C20:1 Omega 9 (Gondoic Acid)	
C20:1 Total (Gondoic Acid + isomers)	
C20:2 Omega 6	
C20:2 Total (Eicosadienoic Acid)	
C20:3 Omega 3	
C20:3 Omega 6	
C20:3, Total (Eicosatrienoic Acid)	
C20:4 Omega 3	
C20:4 Omega 6 (Arachidonic Acid)	
C20:4, Total (Eicosatetraenoic Acid)	
C20:5 Omega 3 (Eicosapentaenoic Acid)	
C21:5 Omega 3 (Heneicosapentaenoic Acid)	
C22:0 (Behenic Acid)	
C22:1 Omega 9 (Erucic Acid)	
C22:1 Total (Erucic Acid + isomers)	
C22:2 Docosadienoic Omega 6	
C22:3 Docosatrienoic, Omega 3	
C22:4 Docosatetraenoic Omega 6	
C22:5 Docosapentaenoic Omega 3	
C22:5 Docosapentaenoic Omega 6	
C22:5 Total (Docosapentaenoic Acid)	
C22:6 Docosahexaenoic Omega 3	
C24:0 (Lignoceric Acid)	
C24:1 Omega 9 (Nervonic Acid)	
C24:1 Total (Nervonic Acid + isomers)	
Total Omega 3 Isomers	
Total Omega 5 Isomers	
Total Omega 6 Isomers	
Total Omega 7 Isomers	
Total Omega 9 Isomers	
Total Monounsaturated Fatty Acids	

(b) (4), (b) (6)

Client Code: JD0000644
PO#: SW

ANALYTICAL REPORT

AR-24-JD-066110-01

Received On: 29Jul2024
Reported On: 12Aug2024

(b) (4):	473-2024-07290286	Sample Registration Date:	29Jul2024
Client Sample Code:	2302104949	Condition Upon Receipt:	acceptable, 23.4°C
Sample Description:	Marigold oleoresin	Sample Reference:	RM01279

QD05C - Fatty Acids-Full Omega 9,6&3 & Trans %W/W	Reference AOAC 996.06 mod.	Accreditation	Completed 12Aug2024	Sub 1
--	--------------------------------------	----------------------	-------------------------------	-----------------

Parameter	Result
Total Polyunsaturated Fatty Acids	(b) (4)
Total Saturated Fatty Acids	
Total Trans Fatty Acids	
Total Fat as Triglycerides	
Total Fatty Acids	

Subcontracting partners:
1: (b) (4)

Respectfully Submitted,

(b) (6)

Results shown in this report relate solely to the item submitted for analysis. | Any opinions/interpretations expressed on this report are given independent of the laboratory's scope of accreditation. | All results are reported on an "As Received" basis unless otherwise stated. | Reports shall not be reproduced except in full without written permission of (b) (4). | All work done in accordance with (b) (4) Terms and Conditions of Sale: (b) (4) | √ Indicates a subcontract test to a different lab. Lab(s) are listed at end of the report. For further details about the performing labs please contact your customer service contact at (b) (4) Measurement of uncertainty can be obtained upon request.

(b) (4)

Microbiology

(b) (4), (b) (6)

(b) (4), (b) (6)

ANALYTICAL REPORT

AR-24-JD-064671-01

Received On: 29Jul2024
Reported On: 08Aug2024

(b) (4)

024-07290287
109504

Sample Registration Date: 29Jul2024
Condition Upon Receipt: acceptable, 23.4°C
Sample Reference: RM01279

C
Sample Description: Marigold oleoresin

QD05C - Fatty Acids-Full Omega 9,6&3 &
Trans %W/W

Accreditation

Completed
08Aug2024

Sub
1

Parameter

- Fatty Acid Profile
- C4:0 (Butyric Acid)
- C6:0 (Caproic acid)
- C8:0 (Caprylic acid)
- C10:0 (Capric acid)
- C11:0 (Undecanoic acid)
- C12:0 (Lauric Acid)
- C14:0 (Myristic acid)
- C14:1 (Myristoleic acid)
- C15:0 (Pentadecanoic acid)
- C15:1 (Pentadecenoic acid)
- C16:0 (Palmitic Acid)
- C16:1 Omega 7
- C16:1 Total (Palmitoleic Acid + isomers)
- C16:2 (Hexadecadienoic Acid)
- C16:3 (Hexadecatrienoic Acid)
- C 16:4 (Hexadecatetraenoic Acid)
- C17:0 (Margaric Acid)
- C17:1 (Heptadecenoic Acid)
- C18:0 (Stearic Acid)
- C18:1 (Vaccenic acid)
- C18:1 Omega 9 (Oleic Acid)
- C18:1, Total (Oleic Acid + isomers)
- C18:2 Omega 6 (Linoleic Acid)
- C18:2, Total (Linoleic Acid + isomers)
- C18:3 Omega 3 (Alpha Linolenic Acid)

(b) (4)

(b) (4), (b) (6)

Client Code: JD0000644
PO#: SW

ANALYTICAL REPORT

AR-24-JD-064671-01

Received On: 29Jul2024
Reported On: 08Aug2024

(b) (4) 473-2024-07290287	Sample Registration Date: 29Jul2024
Client Sample Code: 2304109504	Condition Upon Receipt: acceptable, 23.4°C
Sample Description: Marigold oleoresin	Sample Reference: RM01279

QD05C - Fatty Acids-Full Omega 9,6&3 & Trans %W/W	06 mod.	Accreditation	Completed	Sub
			08Aug2024	1

- Parameter**
- C18:3 Omega 6 (Gamma Linolenic Acid)
 - C18:3, Total (Linolenic Acid + isomers)
 - C18:4 Omega 3 (Octadecatetraenoic Acid)
 - C18:4 Total (Octadecatetraenoic Acid)
 - C20:0 (Arachidic Acid)
 - C20:1 Omega 9 (Gondoic Acid)
 - C20:1 Total (Gondoic Acid + isomers)
 - C20:2 Omega 6
 - C20:2 Total (Eicosadienoic Acid)
 - C20:3 Omega 3
 - C20:3 Omega 6
 - C20:3, Total (Eicosatrienoic Acid)
 - C20:4 Omega 3
 - C20:4 Omega 6 (Arachidonic Acid)
 - C20:4, Total (Eicosatetraenoic Acid)
 - C20:5 Omega 3 (Eicosapentaenoic Acid)
 - C21:5 Omega 3 (Heneicosapentaenoic Ac)
 - C22:0 (Behenic Acid)
 - C22:1 Omega 9 (Erucic Acid)
 - C22:1 Total (Erucic Acid + isomers)
 - C22:2 Docosadienoic Omega 6
 - C22:3 Docosatrienoic, Omega 3
 - C22:4 Docosatetraenoic Omega 6
 - C22:5 Docosapentaenoic Omega 3
 - C22:5 Docosapentaenoic Omega 6
 - C22:5 Total (Docosapentaenoic Acid)
 - C22:6 Docosahexaenoic Omega 3
 - C24:0 (Lignoceric Acid)
 - C24:1 Omega 9 (Nervonic Acid)
 - C24:1 Total (Nervonic Acid + isomers)
 - Total Omega 3 Isomers
 - Total Omega 5 Isomers
 - Total Omega 6 Isomers
 - Total Omega 7 Isomers
 - Total Omega 9 Isomers
 - Total Monounsaturated Fatty Acids

(b) (4)

(b) (4), (b) (6)

Client Code: JD0000644
PO#: SW

ANALYTICAL REPORT

AR-24-JD-064671-01

Received On: 29Jul2024
Reported On: 08Aug2024

	(b) (4) 473-2024-07290287 2304109504	Sample Registration Date: 29Jul2024	
Sample Description:	Marigold oleoresin	Condition Upon Receipt: acceptable, 23.4°C	
		Sample Reference: RM01279	

QD05C - Fatty Acids-Full Omega 9,6&3 & Trans %W/W	06 mod.	Accreditation	Completed	Sub
			08Aug2024	1

Parameter

Total Polyunsaturated Fatty Acids	(b) (4)
Total Saturated Fatty Acids	
Total Trans Fatty Acids	
Total Fat as Triglycerides	
Total Fatty Acids	

Subcontracting partners:
1 - (b) (4)

(b) (6)

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(b) (4)

Microbiology

(b) (4), (b) (6)

(b) (4), (b) (6)

ANALYTICAL REPORT

AR-24-JD-064672-01

Received On: 29Jul2024
Reported On: 08Aug2024

(b) (4)

73-2024-07290288
2305111609

Sample Registration Date: 29Jul2024
Condition Upon Receipt: acceptable, 23.4°C
Sample Reference: RM01279

Sample Description: Marigold oleoresin

QD05C - Fatty Acids-Full Omega 9,6&3 &
Trans %W/W

Accreditation

Completed
08Aug2024

Sub
1

Parameter

- Fatty Acid Profile
- C4:0 (Butyric Acid)
- C6:0 (Caproic acid)
- C8:0 (Caprylic acid)
- C10:0 (Capric acid)
- C11:0 (Undecanoic acid)
- C12:0 (Lauric Acid)
- C14:0 (Myristic acid)
- C14:1 (Myristoleic acid)
- C15:0 (Pentadecanoic acid)
- C15:1 (Pentadecenoic acid)
- C16:0 (Palmitic Acid)
- C16:1 Omega 7
- C16:1 Total (Palmitoleic Acid + isomers)
- C16:2 (Hexadecadienoic Acid)
- C16:3 (Hexadecatrienoic Acid)
- C 16:4 (Hexadecatetraenoic Acid)
- C17:0 (Margaric Acid)
- C17:1 (Heptadecenoic Acid)
- C18:0 (Stearic Acid)
- C18:1 (Vaccenic acid)
- C18:1 Omega 9 (Oleic Acid)
- C18:1, Total (Oleic Acid + isomers)
- C18:2 Omega 6 (Linoleic Acid)
- C18:2, Total (Linoleic Acid + isomers)
- C18:3 Omega 3 (Alpha Linolenic Acid)

(b) (4)

(b) (4), (b) (6)

Client Code: JD0000644

PO#: SW

ANALYTICAL REPORT

AR-24-JD-064672-01

Received On: 29Jul2024

Reported On: 08Aug2024

(b) (4)

2024-07290288

Sample Registration Date: 29Jul2024

Client Sample Code:

111609

Condition Upon Receipt: acceptable, 23.4°C

Sample Description:

Marigold oleoresin

Sample Reference:

RM01279

QD05C - Fatty Acids-Full Omega 9,6&3 & Trans %W/W

6 mod.

Accreditation

Completed
08Aug2024

Sub
1

Parameter

- C18:3 Omega 6 (Gamma Linolenic Acid)
- C18:3, Total (Linolenic Acid + isomers)
- C18:4 Omega 3 (Octadecatetraenoic Acid)
- C18:4 Total (Octadecatetraenoic Acid)
- C20:0 (Arachidic Acid)
- C20:1 Omega 9 (Gondoic Acid)
- C20:1 Total (Gondoic Acid + isomers)
- C20:2 Omega 6
- C20:2 Total (Eicosadienoic Acid)
- C20:3 Omega 3
- C20:3 Omega 6
- C20:3, Total (Eicosatrienoic Acid)
- C20:4 Omega 3
- C20:4 Omega 6 (Arachidonic Acid)
- C20:4, Total (Eicosatetraenoic Acid)
- C20:5 Omega 3 (Eicosapentaenoic Acid)
- C21:5 Omega 3 (Heneicosapentaenoic Aci)
- C22:0 (Behenic Acid)
- C22:1 Omega 9 (Erucic Acid)
- C22:1 Total (Erucic Acid + isomers)
- C22:2 Docosadienoic Omega 6
- C22:3 Docosatrienoic, Omega 3
- C22:4 Docosatetraenoic Omega 6
- C22:5 Docosapentaenoic Omega 3
- C22:5 Docosapentaenoic Omega 6
- C22:5 Total (Docosapentaenoic Acid)
- C22:6 Docosahexaenoic Omega 3
- C24:0 (Lignoceric Acid)
- C24:1 Omega 9 (Nervonic Acid)
- C24:1 Total (Nervonic Acid + isomers)
- Total Omega 3 Isomers
- Total Omega 5 Isomers
- Total Omega 6 Isomers
- Total Omega 7 Isomers
- Total Omega 9 Isomers
- Total Monounsaturated Fatty Acids

(b) (4)

(b) (4), (b) (6)

Client Code: JD0000644

PO#: SW

ANALYTICAL REPORT

AR-24-JD-064672-01

Received On: 29Jul2024

Reported On: 08Aug2024

(b) (4) 473-2024-07290288

Sample Registration Date: 29Jul2024

Client Sample Code: 2305111609

Condition Upon Receipt: acceptable, 23.4°C

Sample Description: Marigold oleoresin

Sample Reference: RM01279

QD05C - Fatty Acids-Full Omega 9,6&3 & Trans %W/W

06 mod.

Accreditation

Completed
08Aug2024

Sub
1

Parameter

Total Polyunsaturated Fatty Acids

(b) (4)

Total Saturated Fatty Acids

Total Trans Fatty Acids

Total Fat as Triglycerides

Total Fatty Acids

Subcontracting partners:

1 - (b) (4)

(b) (6)

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(b) (4)

Microbiology

(b) (4), (b) (6)

(b) (4), (b) (6)

ANALYTICAL REPORT

AR-24-JD-064673-01

Received On: 29Jul2024
Reported On: 08Aug2024

(b) (4)	73-2024-07290289	Sample Registration Date:	29Jul2024
C	2305111648/2308101731	Condition Upon Receipt:	acceptable, 23.4°C
Sample Description:	Marigold oleoresin	Sample Reference:	RM01279

QD05C - Fatty Acids-Full Omega 9,6&3 & Trans %W/W	Accreditation	Completed	Sub
		08Aug2024	1

- Parameter**
- Fatty Acid Profile
 - C4:0 (Butyric Acid)
 - C6:0 (Caproic acid)
 - C8:0 (Caprylic acid)
 - C10:0 (Capric acid)
 - C11:0 (Undecanoic acid)
 - C12:0 (Lauric Acid)
 - C14:0 (Myristic acid)
 - C14:1 (Myristoleic acid)
 - C15:0 (Pentadecanoic acid)
 - C15:1 (Pentadecenoic acid)
 - C16:0 (Palmitic Acid)
 - C16:1 Omega 7
 - C16:1 Total (Palmitoleic Acid + isomers)
 - C16:2 (Hexadecadienoic Acid)
 - C16:3 (Hexadecatrienoic Acid)
 - C 16:4 (Hexadecatetraenoic Acid)
 - C17:0 (Margaric Acid)
 - C17:1 (Heptadecenoic Acid)
 - C18:0 (Stearic Acid)
 - C18:1 (Vaccenic acid)
 - C18:1 Omega 9 (Oleic Acid)
 - C18:1, Total (Oleic Acid + isomers)
 - C18:2 Omega 6 (Linoleic Acid)
 - C18:2, Total (Linoleic Acid + isomers)
 - C18:3 Omega 3 (Alpha Linolenic Acid)

(b) (4)

(b) (4), (b) (6)

Client Code: JD0000644

PO#: SW

ANALYTICAL REPORT

AR-24-JD-064673-01

Received On: 29Jul2024

Reported On: 08Aug2024

(b) (4)

73-2024-07290289

Sample Registration Date: 29Jul2024

C

305111648/2308101731

Condition Upon Receipt: acceptable, 23.4°C

Sample Description:

Marigold oleoresin

Sample Reference:

RM01279

QD05C - Fatty Acids-Full Omega 9,6&3 & Trans %W/W

06 mod.

Accreditation

Completed

Sub

08Aug2024

1

Parameter

- C18:3 Omega 6 (Gamma Linolenic Acid)
- C18:3, Total (Linolenic Acid + isomers)
- C18:4 Omega 3 (Octadecatetraenoic Acid)
- C18:4 Total (Octadecatetraenoic Acid)
- C20:0 (Arachidic Acid)
- C20:1 Omega 9 (Gondoic Acid)
- C20:1 Total (Gondoic Acid + isomers)
- C20:2 Omega 6
- C20:2 Total (Eicosadienoic Acid)
- C20:3 Omega 3
- C20:3 Omega 6
- C20:3, Total (Eicosatrienoic Acid)
- C20:4 Omega 3
- C20:4 Omega 6 (Arachidonic Acid)
- C20:4, Total (Eicosatetraenoic Acid)
- C20:5 Omega 3 (Eicosapentaenoic Acid)
- C21:5 Omega 3 (Heneicosapentaenoic Ac)
- C22:0 (Behenic Acid)
- C22:1 Omega 9 (Erucic Acid)
- C22:1 Total (Erucic Acid + isomers)
- C22:2 Docosadienoic Omega 6
- C22:3 Docosatrienoic, Omega 3
- C22:4 Docosatetraenoic Omega 6
- C22:5 Docosapentaenoic Omega 3
- C22:5 Docosapentaenoic Omega 6
- C22:5 Total (Docosapentaenoic Acid)
- C22:6 Docosahexaenoic Omega 3
- C24:0 (Lignoceric Acid)
- C24:1 Omega 9 (Nervonic Acid)
- C24:1 Total (Nervonic Acid + isomers)
- Total Omega 3 Isomers
- Total Omega 5 Isomers
- Total Omega 6 Isomers
- Total Omega 7 Isomers
- Total Omega 9 Isomers
- Total Monounsaturated Fatty Acids

(b) (4)

(b) (4), (b) (6)

Client Code: JD0000644

PO#: SW

ANALYTICAL REPORT

AR-24-JD-064673-01

Received On: 29Jul2024

Reported On: 08Aug2024

(b) (4)

473-2024-07290289

Sample Registration Date: 29Jul2024

2305111648/2308101731

Condition Upon Receipt: acceptable, 23.4°C

C
Sample Description: Marigold oleoresin

Sample Reference: RM01279

QD05C - Fatty Acids-Full Omega 9,6&3 &
Trans %W/W

e
6.06 mod.

Accreditation

Completed
08Aug2024

Sub
1

Parameter

Total Polyunsaturated Fatty Acids

(b) (4)

Total Saturated Fatty Acids

Total Trans Fatty Acids

Total Fat as Triglycerides

Total Fatty Acids

Subcontracting partners:

1 - (b) (4)

(b) (6)

... rely to the item submitted for analysis. | Any opinions/interpretations expressed on this report are given independent of the laboratory's scope of accreditation. | All results are reported on an "As Received" basis unless otherwise stated. | Reports shall not be reproduced except in full without written permission of (b) (4) | All work done in accordance with (b) (4) General Terms and Conditions of Sale: (b) (4) | √ Indicates a subcontract test to a different lab. Lab(s) are listed at end of the report. For further details about the performing labs please contact your customer service contact at (b) (4) Measurement of uncertainty can be obtained upon request.

(b) (4)

(b) (4), (b) (6)

5 September 2024

Lab Report: Analysis of Marigold Oleoresin

Introduction

(b) (4) requested to analyze the total carotenoids, lutein, zeaxanthin, hexane, waxes, and ash from lot retains of marigold oleoresin.

Sample Description

Marigold Oleoresin Lots:

(b) (4) (same supplier lot number)

Methods of analysis

(b) (4)

Results

		Lot number
Test Method	Parameter	
(b) (4)	Total Carotenoids (g/kg)	(b) (4)
	Lutein (g/kg)	
	Zeaxanthin (g/kg)	
	Ash (%)	
	Total waxes (C29-C36) (%)	
	Moisture (%)	

Approved by: (b) (6) Quality Control Associate Director

Date: Sept. 5, 2024

(b) (4)

(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

ANALYTICAL REPORT

AR-24-YI-001112-01

Received On: 15Feb2024
Reported On: 28Feb2024

(b) (4)

129-2024-02150034

Sample Registration Date: 15Feb2024

Client Sample Code: 05/A-001-IDP

Condition Upon Receipt: acceptable, 20.3°C

Sample Description: Oleorresina Saponificada NT

Sample Reference: Lot #1 After Saponification

QD05C - Fatty Acids-Full Omega 9,6&3 & Trans %W/W

Accreditation

Completed
28Feb2024

Sub
1

Parameter

Fatty Acid Profile A

C4:0 (Butyric Acid) A

C6:0 (Caproic acid) A

C8:0 (Caprylic acid) A

C10:0 (Capric acid) A

C11:0 (Undecanoic acid) A

C12:0 (Lauric Acid) A

C14:0 (Myristic acid) A

C14:1 (Myristoleic acid) A

C15:0 (Pentadecanoic acid) A

C15:1 (Pentadecenoic acid) A

C16:0 (Palmitic Acid) A

C16:1 Omega 7 A

C16:1 Total (Palmitoleic Acid + isomers)

C16:2 (Hexadecadienoic Acid) A

C16:3 (Hexadecatrienoic Acid) A

C 16:4 (Hexadecatetraenoic Acid) A

C17:0 (Margaric Acid) A

C17:1 (Heptadecenoic Acid) A

C18:0 (Stearic Acid) A

C18:1 (Vaccenic acid) A

C18:1 Omega 9 (Oleic Acid) A

C18:1, Total (Oleic Acid + isomers) A

C18:2 Omega 6 (Linoleic Acid) A

C18:2, Total (Linoleic Acid + isomers) A

(b) (4)

0.02 %

0.02 %

0.02 %

0.02 %

0.02 %

0.02 %

0.02 %

0.02 %

0.02 %

0.02 %

0.02 %

0.04 %

0.04 %

0.02 %

0.02 %

0.02 %

0.02 %

0.02 %

0.02 %

0.03 %

0.02 %

0.03 %

0.02 %

0.02 %

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-24-YI-001112-01

Received On: 15Feb2024

Reported On: 28Feb2024

(b) (4) 129-2024-02150034

Sample Registration Date: 15Feb2024

Client Sample Code: 05/A-001-IDP

Condition Upon Receipt: acceptable, 20.3°C

Sample Description: Oleorresina Saponificada NT

Sample Reference: Lot #1 After Saponification

QD05C - Fatty Acids-Full Omega 9,6&3 & Trans %W/W

06 mod.

Accreditation

Completed
28Feb2024

Sub
1

Parameter	LOQ
C18:3 Omega 3 (Alpha Linolenic Acid) A	0.02 %
C18:3 Omega 6 (Gamma Linolenic Acid) A	0.02 %
C18:3, Total (Linolenic Acid + isomers) A	0.02 %
C18:4 Omega 3 (Octadecatetraenoic Acid)	0.02 %
C18:4 Total (Octadecatetraenoic Acid) A	0.02 %
C20:0 (Arachidic Acid) A	0.02 %
C20:1 Omega 9 (Gondoic Acid) A	0.02 %
C20:1 Total (Gondoic Acid + isomers) A	0.02 %
C20:2 Omega 6 A	0.02 %
C20:2 Total (Eicosadienoic Acid) A	0.02 %
C20:3 Omega 3 A	0.02 %
C20:3 Omega 6 A	0.02 %
C20:3, Total (Eicosatrienoic Acid) A	0.02 %
C20:4 Omega 3 A	0.02 %
C20:4 Omega 6 (Arachidonic Acid) A	0.02 %
C20:4, Total (Eicosatetraenoic Acid) A	0.02 %
C20:5 Omega 3 (Eicosapentaenoic Acid) A	0.02 %
C21:5 Omega 3 (Heneicosapentaenoic Acid) A	0.02 %
C22:0 (Behenic Acid) A	0.02 %
C22:1 Omega 9 (Erucic Acid) A	0.02 %
C22:1 Total (Erucic Acid + isomers) A	0.02 %
C22:2 Docosadienoic Omega 6 A	0.02 %
C22:3 Docosatrienoic, Omega 3 A	0.02 %
C22:4 Docosatetraenoic Omega 6 A	0.02 %
C22:5 Docosapentaenoic Omega 3 A	0.02 %
C22:5 Docosapentaenoic Omega 6 A	0.02 %
C22:5 Total (Docosapentaenoic Acid) A	0.02 %
C22:6 Docosahexaenoic Omega 3 A	0.02 %
C24:0 (Lignoceric Acid) A	0.02 %
C24:1 Omega 9 (Nervonic Acid) A	0.02 %
C24:1 Total (Nervonic Acid + isomers) A	0.02 %
Total Omega 3 Isomers A	0.05 %
Total Omega 5 Isomers A	0.05 %

(b) (4)

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-24-YI-001112-01

Received On: 15Feb2024

Reported On: 28Feb2024

(b) (4)

129-2024-02150034

Sample Registration Date: 15Feb2024

Client Sample Code: 05/A-001-IDP

Condition Upon Receipt: acceptable, 20.3°C

Sample Description: Oleorresina Saponificada NT

Sample Reference: Lot #1 After Saponification

QD05C - Fatty Acids-Full Omega 9,6&3 & Trans %W/W

Accreditation

Completed
28Feb2024

Sub
1

Parameter	LOQ
Total Omega 6 Isomers A	0.05 %
Total Omega 7 Isomers A	0.05 %
Total Omega 9 Isomers A	0.05 %
Total Monounsaturated Fatty Acids A	0.05 %
Total Polyunsaturated Fatty Acids A	0.05 %
Total Saturated Fatty Acids A	0.05 %
Total Trans Fatty Acids A	0.02 %
Total Fat as Triglycerides A	0.1 %
Total Fatty Acids A	0.1 %
Fatty Acid Profile B	
C4:0 (Butyric Acid) B	0.02 %
C6:0 (Caproic acid) B	0.02 %
C8:0 (Caprylic acid) B	0.02 %
C10:0 (Capric acid) B	0.02 %
C11:0 (Undecanoic acid) B	0.02 %
C12:0 (Lauric Acid) B	0.02 %
C14:0 (Myristic acid) B	0.02 %
C14:1 (Myristoleic acid) B	0.02 %
C15:0 (Pentadecanoic acid) B	0.02 %
C15:1 (Pentadecenoic acid) B	0.02 %
C16:0 (Palmitic Acid) B	0.02 %
C16:1 Omega 7 B	0.04 %
C16:1 Total (Palmitoleic Acid + isomers)	0.04 %
C16:2 (Hexadecadienoic Acid) B	0.02 %
C16:3 (Hexadecatrienoic Acid) B	0.02 %
C 16:4 (Hexadecatetraenoic Acid) B	0.02 %
C17:0 (Margaric Acid) B	0.02 %
C17:1 (Heptadecenoic Acid) B	0.02 %
C18:0 (Stearic Acid) B	0.02 %
C18:1 (Vaccenic acid) B	0.03 %
C18:1 Omega 9 (Oleic Acid) B	0.02 %
C18:1, Total (Oleic Acid + isomers) B	0.03 %
C18:2 Omega 6 (Linoleic Acid) B	0.02 %
C18:2, Total (Linoleic Acid + isomers) B	0.02 %

(b) (4)

(b) (6)
 500 Fountain Lakes Blvd, Suite 100
 St. Charles, MO 63301

ANALYTICAL REPORT

AR-24-YI-001112-01

Received On: 15Feb2024
 Reported On: 28Feb2024

(b) (4)

129-2024-02150034

Sample Registration Date: 15Feb2024

Client Sample Code: 05/A-001-IDP

Condition Upon Receipt: acceptable, 20.3°C

Sample Description: Oleorresina Saponificada NT

Sample Reference: Lot #1 After Saponification

QD05C - Fatty Acids-Full Omega 9,6&3 & Trans %W/W

d.

Accreditation

Completed
28Feb2024

Sub
1

Parameter	LOQ
C18:3 Omega 3 (Alpha Linolenic Acid) B	0.02 %
C18:3 Omega 6 (Gamma Linolenic Acid) B	0.02 %
C18:3, Total (Linolenic Acid + isomers) B	0.02 %
C18:4 Omega 3 (Octadecatetraenoic Acid)	0.02 %
C18:4 Total (Octadecatetraenoic Acid) B	0.02 %
C20:0 (Arachidic Acid) B	0.02 %
C20:1 Omega 9 (Gondoic Acid) B	0.02 %
C20:1 Total (Gondoic Acid + isomers) B	0.02 %
C20:2 Omega 6 B	0.02 %
C20:2 Total (Eicosadienoic Acid) B	0.02 %
C20:3 Omega 3 B	0.02 %
C20:3 Omega 6 B	0.02 %
C20:3, Total (Eicosatrienoic Acid) B	0.02 %
C20:4 Omega 3 B	0.02 %
C20:4 Omega 6 (Arachidonic Acid) B	0.02 %
C20:4, Total (Eicosatetraenoic Acid) B	0.02 %
C20:5 Omega 3 (Eicosapentaenoic Acid)	0.02 %
C21:5 Omega 3 (Heneicosapentaenoic Ac B	0.02 %
C22:0 (Behenic Acid) B	0.02 %
C22:1 Omega 9 (Erucic Acid) B	0.02 %
C22:1 Total (Erucic Acid + isomers) B	0.02 %
C22:2 Docosadienoic Omega 6 B	0.02 %
C22:3 Docosatrienoic, Omega 3 B	0.02 %
C22:4 Docosatetraenoic Omega 6 B	0.02 %
C22:5 Docosapentaenoic Omega 3 B	0.02 %
C22:5 Docosapentaenoic Omega 6 B	0.02 %
C22:5 Total (Docosapentaenoic Acid) B	0.02 %
C22:6 Docosahexaenoic Omega 3 B	0.02 %
C24:0 (Lignoceric Acid) B	0.02 %
C24:1 Omega 9 (Nervonic Acid) B	0.02 %
C24:1 Total (Nervonic Acid + isomers) B	0.02 %
Total Omega 3 Isomers B	0.05 %
Total Omega 5 Isomers B	0.05 %

(b) (4)

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-24-YI-001112-01

Received On: 15Feb2024
Reported On: 28Feb2024

(b) (4)

129-2024-02150034

Sample Registration Date: 15Feb2024

Client Sample Code: 05/A-001-IDP

Condition Upon Receipt: acceptable, 20.3°C

Sample Description: Oleorresina Saponificada NT

Sample Reference: Lot #1 After Saponification

QD05C - Fatty Acids-Full Omega 9,6&3 & Trans %W/W	6 mod.	Accreditation	Completed 28Feb2024	Sub 1
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Parameter	Result	LOQ
Total Omega 6 Isomers B	(b) (4)	0.05 %
Total Omega 7 Isomers B	(b) (4)	0.05 %
Total Omega 9 Isomers B	(b) (4)	0.05 %
Total Monounsaturated Fatty Acids B	(b) (4)	0.05 %
Total Polyunsaturated Fatty Acids B	(b) (4)	0.05 %
Total Saturated Fatty Acids B	(b) (4)	0.05 %
Total Trans Fatty Acids B	(b) (4)	0.02 %
Total Fat as Triglycerides B	(b) (4)	0.1 %
Total Fatty Acids B	(b) (4)	0.1 %

QD148 - Moisture by Vacuum Oven	AOAC 925.09	Accreditation	Completed 28Feb2024	Sub 1
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Parameter	Result	LOQ
Moisture and Volatiles - Vacuum Oven A	(b) (4)	0.5 %
Moisture and Volatiles - Vacuum Oven B	(b) (4)	0.5 %

QD681 - Ash - (liquids, oils, fats, low level)	Reference AOAC 942.05	Accreditation	Completed 28Feb2024	Sub 1
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Parameter	Result	LOQ
Ash A	(b) (4)	0.05 %
Ash B	(b) (4)	0.05 %

TKI06 - Lutein From Tagetes Erecta by JECFA		Accreditation	Completed 27Feb2024	Sub 2
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Parameter	Result
Solubility A	(b) (4)
Spectrophotometry A	(b) (4)
Test for Carotenoids A	(b) (4)
Moisture A	(b) (4)
Ash A	(b) (4)
Zeaxanthin A	(b) (4)
Methanol A	(b) (4)
Propylene Glycol A	(b) (4)
Waxes A	(b) (4)
Assay, Carotenoids A	(b) (4)

(b) (6)
500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

ANALYTICAL REPORT

AR-24-YI-001112-01

Received On: 15Feb2024

Reported On: 28Feb2024

(b) (4) 129-2024-02150034

Sample Registration Date: 15Feb2024

Client Sample Code: 05/A-001-IDP

Condition Upon Receipt: acceptable, 20.3°C

Sample Description: Oleorresina Saponificada NT

Sample Reference: Lot #1 After Saponification

TKI06 - Lutein From Tagetes Erecta by JECFA

Accreditation

Completed
27Feb2024

Sub
2

Parameter

- Assay, Lutein A
- Solubility B
- Spectrophotometry B
- Test for Carotenoids B
- Moisture B
- Ash B
- Zeaxanthin B
- Methanol B
- Propylene Glycol B
- Waxes B
- Assay, Carotenoids B
- Assay, Lutein B

(b) (4)

YI004 - Carotenoid Profile

d (HPLC) - ECT

Completed
28Feb2024

Parameter

- Alpha-carotene A
- cis-beta-Carotene A
- trans-beta-Carotene A
- Total beta-Carotene A
- alpha-Cryptoxanthin A
- (all-E)-β-Cryptoxanthin A
- Gamma-Carotene A
- cis-Lycopene A
- trans-Lycopene A
- Total Lycopene A
- Lutein A
- Zeaxanthin A
- Total carotenoids A
- Alpha-carotene B
- cis-beta-Carotene B
- trans-beta-Carotene B
- Total beta-Carotene B
- alpha-Cryptoxanthin B
- (all-E)-β-Cryptoxanthin B

(b) (4)

LOQ

- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g

Royal Canin

Client Code: YI0000062

PO#: LEO0US230292-03

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-24-YI-001112-01

Received On: 15Feb2024

Reported On: 28Feb2024

(b) (4)

129-2024-02150034

Sample Registration Date: 15Feb2024

Client Sample Code: 05/A-001-IDP

Condition Upon Receipt: acceptable, 20.3°C

Sample Description: Oleoresina Saponificada NT

Sample Reference: Lot #1 After Saponification

YI004 - Carotenoid Profile

(HPLC) - ECT

Completed
28Feb2024

Parameter		LOQ
Gamma-Carotene B	(b) (4)	0.03 µg/g
cis-Lycopene B	(b) (4)	0.03 µg/g
trans-Lycopene B	(b) (4)	0.03 µg/g
Total Lycopene B	(b) (4)	0.03 µg/g
Lutein B	(b) (4)	0.03 µg/g
Zeaxanthin B	(b) (4)	0.03 µg/g
Total carotenoids B	(b) (4)	0.03 µg/g

Subcontracting partners:

- 1 - (b) (4)
- 2 - (b) (4)

Respectfully Submitted,

(b) (6)

Department Manager Department Manager

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

ANALYTICAL REPORT

AR-24-YI-001113-01

Received On: 15Feb2024

Reported On: 28Feb2024

(b) (4)

129-2024-02150035

Sample Registration Date: 15Feb2024

Client Sample Code: 05/B-002-IDP

Condition Upon Receipt: acceptable, 20.3°C

Sample Description: Oleorresina Saponificada NT

Sample Reference: 05/B-002-IDP After Saponification

QD05C - Fatty Acids-Full Omega 9,6&3 &
Trans %W/W

Accreditation

Completed
28Feb2024

Sub
1

Parameter

Fatty Acid Profile A	(b) (4)	
C4:0 (Butyric Acid) A	(b) (4)	0.02 %
C6:0 (Caproic acid) A	(b) (4)	0.02 %
C8:0 (Caprylic acid) A	(b) (4)	0.02 %
C10:0 (Capric acid) A	(b) (4)	0.02 %
C11:0 (Undecanoic acid) A	(b) (4)	0.02 %
C12:0 (Lauric Acid) A	(b) (4)	0.02 %
C14:0 (Myristic acid) A	(b) (4)	0.02 %
C14:1 (Myristoleic acid) A	(b) (4)	0.02 %
C15:0 (Pentadecanoic acid) A	(b) (4)	0.02 %
C15:1 (Pentadecenoic acid) A	(b) (4)	0.02 %
C16:0 (Palmitic Acid) A	(b) (4)	0.02 %
C16:1 Omega 7 A	(b) (4)	0.04 %
C16:1 Total (Palmitoleic Acid + isomers)	(b) (4)	0.04 %
C16:2 (Hexadecadienoic Acid) A	(b) (4)	0.02 %
C16:3 (Hexadecatrienoic Acid) A	(b) (4)	0.02 %
C 16:4 (Hexadecatetraenoic Acid) A	(b) (4)	0.02 %
C17:0 (Margaric Acid) A	(b) (4)	0.02 %
C17:1 (Heptadecenoic Acid) A	(b) (4)	0.02 %
C18:0 (Stearic Acid) A	(b) (4)	0.02 %
C18:1 (Vaccenic acid) A	(b) (4)	0.03 %
C18:1 Omega 9 (Oleic Acid) A	(b) (4)	0.02 %
C18:1, Total (Oleic Acid + isomers) A	(b) (4)	0.03 %
C18:2 Omega 6 (Linoleic Acid) A	(b) (4)	0.02 %
C18:2, Total (Linoleic Acid + isomers) A	(b) (4)	0.02 %

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-24-YI-001113-01

Received On: 15Feb2024
Reported On: 28Feb2024

(b) (4)

129-2024-02150035

Sample Registration Date: 15Feb2024

Client Sample Code: 05/B-002-IDP

Condition Upon Receipt: acceptable, 20.3°C

Sample Description: Oleorresina Saponificada NT

Sample Reference: 05/B-002-IDP After Saponification

QD05C - Fatty Acids-Full Omega 9,6&3 & Trans %W/W

od.

Accreditation

Completed
28Feb2024

Sub
1

Parameter	LOQ
C18:3 Omega 3 (Alpha Linolenic Acid) A	0.02 %
C18:3 Omega 6 (Gamma Linolenic Acid)	0.02 %
C18:3, Total (Linolenic Acid + isomers)	0.02 %
C18:4 Omega 3 (Octadecatetraenoic Acid)	0.02 %
C18:4 Total (Octadecatetraenoic Acid)	0.02 %
C20:0 (Arachidic Acid) A	0.02 %
C20:1 Omega 9 (Gondoic Acid) A	0.02 %
C20:1 Total (Gondoic Acid + isomers)	0.02 %
C20:2 Omega 6 A	0.02 %
C20:2 Total (Eicosadienoic Acid) A	0.02 %
C20:3 Omega 3 A	0.02 %
C20:3 Omega 6 A	0.02 %
C20:3, Total (Eicosatrienoic Acid) A	0.02 %
C20:4 Omega 3 A	0.02 %
C20:4 Omega 6 (Arachidonic Acid) A	0.02 %
C20:4, Total (Eicosatetraenoic Acid) A	0.02 %
C20:5 Omega 3 (Eicosapentaenoic Acid)	0.02 %
C21:5 Omega 3 (Heneicosapentaenoic Ac A	0.02 %
C22:0 (Behenic Acid) A	0.02 %
C22:1 Omega 9 (Erucic Acid) A	0.02 %
C22:1 Total (Erucic Acid + isomers) A	0.02 %
C22:2 Docosadienoic Omega 6 A	0.02 %
C22:3 Docosatrienoic, Omega 3 A	0.02 %
C22:4 Docosatetraenoic Omega 6 A	0.02 %
C22:5 Docosapentaenoic Omega 3 A	0.02 %
C22:5 Docosapentaenoic Omega 6 A	0.02 %
C22:5 Total (Docosapentaenoic Acid)	0.02 %
C22:6 Docosahexaenoic Omega 3 A	0.02 %
C24:0 (Lignoceric Acid) A	0.02 %
C24:1 Omega 9 (Nervonic Acid) A	0.02 %
C24:1 Total (Nervonic Acid + isomers) A	0.02 %
Total Omega 3 Isomers A	0.05 %
Total Omega 5 Isomers A	0.05 %

(b) (4)

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-24-YI-001113-01

Received On: 15Feb2024

Reported On: 28Feb2024

(b) (4)

129-2024-02150035

Sample Registration Date: 15Feb2024

Client Sample Code: 05/B-002-IDP

Condition Upon Receipt: acceptable, 20.3°C

Sample Description: Oleorresina Saponificada NT

Sample Reference: 05/B-002-IDP After Saponification

**QD05C - Fatty Acids-Full Omega 9,6&3
Trans %W/W**

Accreditation

Completed
28Feb2024

Sub
1

Parameter	LOQ
Total Omega 6 Isomers A	0.05 %
Total Omega 7 Isomers A	0.05 %
Total Omega 9 Isomers A	0.05 %
Total Monounsaturated Fatty Acids A	0.05 %
Total Polyunsaturated Fatty Acids A	0.05 %
Total Saturated Fatty Acids A	0.05 %
Total Trans Fatty Acids A	0.02 %
Total Fat as Triglycerides A	0.1 %
Total Fatty Acids A	0.1 %
Fatty Acid Profile B	
C4:0 (Butyric Acid) B	0.02 %
C6:0 (Caproic acid) B	0.02 %
C8:0 (Caprylic acid) B	0.02 %
C10:0 (Capric acid) B	0.02 %
C11:0 (Undecanoic acid) B	0.02 %
C12:0 (Lauric Acid) B	0.02 %
C14:0 (Myristic acid) B	0.02 %
C14:1 (Myristoleic acid) B	0.02 %
C15:0 (Pentadecanoic acid) B	0.02 %
C15:1 (Pentadecenoic acid) B	0.02 %
C16:0 (Palmitic Acid) B	0.02 %
C16:1 Omega 7 B	0.04 %
C16:1 Total (Palmitoleic Acid + isomers)	0.04 %
C16:2 (Hexadecadienoic Acid) B	0.02 %
C16:3 (Hexadecatrienoic Acid) B	0.02 %
C 16:4 (Hexadecatetraenoic Acid) B	0.02 %
C17:0 (Margaric Acid) B	0.02 %
C17:1 (Heptadecenoic Acid) B	0.02 %
C18:0 (Stearic Acid) B	0.02 %
C18:1 (Vaccenic acid) B	0.03 %
C18:1 Omega 9 (Oleic Acid) B	0.02 %
C18:1, Total (Oleic Acid + isomers) B	0.03 %
C18:2 Omega 6 (Linoleic Acid) B	0.02 %
C18:2, Total (Linoleic Acid + isomers) B	0.02 %

(b) (4)

LOQ

0.05 %

0.05 %

0.05 %

0.05 %

0.05 %

0.05 %

0.02 %

0.1 %

0.1 %

0.02 %

0.02 %

0.02 %

0.02 %

0.02 %

0.02 %

0.02 %

0.02 %

0.02 %

0.02 %

0.02 %

0.04 %

0.04 %

0.02 %

0.02 %

0.02 %

0.02 %

0.02 %

0.02 %

0.03 %

0.02 %

0.03 %

0.02 %

0.02 %

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-24-YI-001113-01

Received On: 15Feb2024

Reported On: 28Feb2024

(b) (4)

129-2024-02150035

Sample Registration Date: 15Feb2024

Client Sample Code: 05/B-002-IDP

Condition Upon Receipt: acceptable, 20.3°C

Sample Description: Oleorresina Saponificada NT

Sample Reference: 05/B-002-IDP After Saponification

QD05C - Fatty Acids-Full Omega 9,6&3 & Trans %W/W

6 mod.

Accreditation

Completed
28Feb2024

Sub
1

Parameter	LOQ
C18:3 Omega 3 (Alpha Linolenic Acid) B	0.02 %
C18:3 Omega 6 (Gamma Linolenic Acid) B	0.02 %
C18:3, Total (Linolenic Acid + isomers) B	0.02 %
C18:4 Omega 3 (Octadecatetraenoic Acid)	0.02 %
C18:4 Total (Octadecatetraenoic Acid) B	0.02 %
C20:0 (Arachidic Acid) B	0.02 %
C20:1 Omega 9 (Gondoic Acid) B	0.02 %
C20:1 Total (Gondoic Acid + isomers) B	0.02 %
C20:2 Omega 6 B	0.02 %
C20:2 Total (Eicosadienoic Acid) B	0.02 %
C20:3 Omega 3 B	0.02 %
C20:3 Omega 6 B	0.02 %
C20:3, Total (Eicosatrienoic Acid) B	0.02 %
C20:4 Omega 3 B	0.02 %
C20:4 Omega 6 (Arachidonic Acid) B	0.02 %
C20:4, Total (Eicosatetraenoic Acid) B	0.02 %
C20:5 Omega 3 (Eicosapentaenoic Acid)	0.02 %
C21:5 Omega 3 (Heneicosapentaenoic Acid) B	0.02 %
C22:0 (Behenic Acid) B	0.02 %
C22:1 Omega 9 (Erucic Acid) B	0.02 %
C22:1 Total (Erucic Acid + isomers) B	0.02 %
C22:2 Docosadienoic Omega 6 B	0.02 %
C22:3 Docosatrienoic, Omega 3 B	0.02 %
C22:4 Docosatetraenoic Omega 6 B	0.02 %
C22:5 Docosapentaenoic Omega 3 B	0.02 %
C22:5 Docosapentaenoic Omega 6 B	0.02 %
C22:5 Total (Docosapentaenoic Acid) B	0.02 %
C22:6 Docosahexaenoic Omega 3 B	0.02 %
C24:0 (Lignoceric Acid) B	0.02 %
C24:1 Omega 9 (Nervonic Acid) B	0.02 %
C24:1 Total (Nervonic Acid + isomers) B	0.02 %
Total Omega 3 Isomers B	0.05 %
Total Omega 5 Isomers B	0.05 %

(b) (4)

(b) (6)
 500 Fountain Lakes Blvd, Suite 100
 St. Charles, MO 63301

ANALYTICAL REPORT

AR-24-YI-001113-01

Received On: 15Feb2024

Reported On: 28Feb2024

(b) (4)

129-2024-02150035

Sample Registration Date: 15Feb2024

Client Sample Code: 05/B-002-IDP

Condition Upon Receipt: acceptable, 20.3°C

Sample Description: Oleorresina Saponificada NT

Sample Reference: 05/B-002-IDP After Saponification

QD05C - Fatty Acids-Full Omega 9,6&3 & Trans %W/W	6 mod.	Accreditation	Completed 28Feb2024	Sub 1
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Parameter	Result	LOQ
Total Omega 6 Isomers B	(b) (4)	0.05 %
Total Omega 7 Isomers B	(b) (4)	0.05 %
Total Omega 9 Isomers B	(b) (4)	0.05 %
Total Monounsaturated Fatty Acids B	(b) (4)	0.05 %
Total Polyunsaturated Fatty Acids B	(b) (4)	0.05 %
Total Saturated Fatty Acids B	(b) (4)	0.05 %
Total Trans Fatty Acids B	(b) (4)	0.02 %
Total Fat as Triglycerides B	(b) (4)	0.1 %
Total Fatty Acids B	(b) (4)	0.1 %

QD148 - Moisture by Vacuum Oven	09	Accreditation	Completed 28Feb2024	Sub 1
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Parameter	Result	LOQ
Moisture and Volatiles - Vacuum Oven A	(b) (4)	0.5 %
Moisture and Volatiles - Vacuum Oven B	(b) (4)	0.5 %

QD681 - Ash - (liquids, oils, fats, low level)	Reference AOAC 942.05	Accreditation	Completed 28Feb2024	Sub 1
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Parameter	Result	LOQ
Ash A	(b) (4)	0.05 %
Ash B	(b) (4)	0.05 %

TKI06 - Lutein From Tagetes Erecta by JECFA	Accreditation	Completed 27Feb2024	Sub 2
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Parameter	Result
Solubility A	(b) (4)
Spectrophotometry A	(b) (4)
Test for Carotenoids A	(b) (4)
Moisture A	(b) (4)
Ash A	(b) (4)
Zeaxanthin A	(b) (4)
Methanol A	(b) (4)
Propylene Glycol A	(b) (4)
Waxes A	(b) (4)
Assay, Carotenoids A	(b) (4)

(b) (6)
500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

ANALYTICAL REPORT

AR-24-YI-001113-01

Received On: 15Feb2024

Reported On: 28Feb2024

(b) (4)

129-2024-02150035

Sample Registration Date: 15Feb2024

Client Sample Code: 05/B-002-IDP

Condition Upon Receipt: acceptable, 20.3°C

Sample Description: Oleoresina Saponificada NT

Sample Reference: 05/B-002-IDP After Saponification

TKI06 - Lutein From Tagetes Erecta by JECFA

Accreditation

Completed
27Feb2024

Sub
2

Parameter

- Assay, Lutein A
- Solubility B
- Spectrophotometry B
- Test for Carotenoids B
- Moisture B
- Ash B
- Zeaxanthin B
- Methanol B
- Propylene Glycol B
- Waxes B
- Assay, Carotenoids B
- Assay, Lutein B

(b) (4)

YI004 - Carotenoid Profile

d (HPLC) - ECT

Completed
28Feb2024

Parameter

- Alpha-carotene A
- cis-beta-Carotene A
- trans-beta-Carotene A
- Total beta-Carotene A
- alpha-Cryptoxanthin A
- (all-E)-β-Cryptoxanthin A
- Gamma-Carotene A
- cis-Lycopene A
- trans-Lycopene A
- Total Lycopene A
- Lutein A
- Zeaxanthin A
- Total carotenoids A
- Alpha-carotene B
- cis-beta-Carotene B
- trans-beta-Carotene B
- Total beta-Carotene B
- alpha-Cryptoxanthin B
- (all-E)-β-Cryptoxanthin B

(b) (4)

LOQ

- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-24-YI-001113-01

Received On: 15Feb2024

Reported On: 28Feb2024

(b) (4)

129-2024-02150035

Sample Registration Date: 15Feb2024

Client Sample Code:

05/B-002-IDP

Condition Upon Receipt: acceptable, 20.3°C

Sample Description:

Oleoresina Saponificada NT

Sample Reference: 05/B-002-IDP After Saponification

YI004 - Carotenoid Profile

HPLC) - ECT

Completed
28Feb2024

Parameter		LOQ
Gamma-Carotene B	(b) (4)	0.03 µg/g
cis-Lycopene B	(b) (4)	0.03 µg/g
trans-Lycopene B	(b) (4)	0.03 µg/g
Total Lycopene B	(b) (4)	0.03 µg/g
Lutein B	(b) (4)	0.03 µg/g
Zeaxanthin B	(b) (4)	0.03 µg/g
Total carotenoids B	(b) (4)	0.03 µg/g

Subcontracting partners:

- 1 (b) (4)
- 2 (b) (4)

(b) (6)

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)
500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

ANALYTICAL REPORT

AR-24-YI-001114-01

Received On: 15Feb2024
Reported On: 28Feb2024

(b) (4) Sample Code:	129-2024-02150036	Sample Registration Date:	15Feb2024
Client Sample Code:	05/C-003-IPD	Condition Upon Receipt:	acceptable, 20.3°C
Sample Description:	Oleoresina Saponificada NT	Sample Reference:	05/C-003-IPD After Saponification

QD05C - Fatty Acids-Full Omega 9,6&3 & Reference	Accreditation	Completed	Sub
Trans %W/W	AOAC 996.06 mod.	28Feb2024	1

Parameter		
Fatty Acid Profile A	as Fatty Acids	
C4:0 (Butyric Acid) A	(b) (4)	0.02 %
C6:0 (Caproic acid) A	(b) (4)	0.02 %
C8:0 (Caprylic acid) A	(b) (4)	0.02 %
C10:0 (Capric acid) A	(b) (4)	0.02 %
C11:0 (Undecanoic acid) A	(b) (4)	0.02 %
C12:0 (Lauric Acid) A	(b) (4)	0.02 %
C14:0 (Myristic acid) A	(b) (4)	0.02 %
C14:1 (Myristoleic acid) A	(b) (4)	0.02 %
C15:0 (Pentadecanoic acid) A	(b) (4)	0.02 %
C15:1 (Pentadecenoic acid) A	(b) (4)	0.02 %
C16:0 (Palmitic Acid) A	(b) (4)	0.02 %
C16:1 Omega 7 A	(b) (4)	0.04 %
C16:1 Total (Palmitoleic Acid + isomers)	(b) (4)	0.04 %
C16:2 (Hexadecadienoic Acid) A	(b) (4)	0.02 %
C16:3 (Hexadecatrienoic Acid) A	(b) (4)	0.02 %
C 16:4 (Hexadecatetraenoic Acid) A	(b) (4)	0.02 %
C17:0 (Margaric Acid) A	(b) (4)	0.02 %
C17:1 (Heptadecenoic Acid) A	(b) (4)	0.02 %
C18:0 (Stearic Acid) A	(b) (4)	0.02 %
C18:1 (Vaccenic acid) A	(b) (4)	0.03 %
C18:1 Omega 9 (Oleic Acid) A	(b) (4)	0.02 %
C18:1, Total (Oleic Acid + isomers) A	(b) (4)	0.03 %
C18:2 Omega 6 (Linoleic Acid) A	(b) (4)	0.02 %
C18:2, Total (Linoleic Acid + isomers) A	(b) (4)	0.02 %

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-24-YI-001114-01

Received On: 15Feb2024

Reported On: 28Feb2024

(b) (4)

129-2024-02150036

Sample Registration Date: 15Feb2024

Client Sample Code: 05/C-003-IPD

Condition Upon Receipt: acceptable, 20.3°C

Sample Description: Oleorresina Saponificada NT

Sample Reference: 05/C-003-IPD After Saponification

QD05C - Fatty Acids-Full Omega 9,6&3 & Trans %W/W	e	Accreditation	Completed	Sub
	.06 mod.		28Feb2024	1

Parameter	LOQ
C18:3 Omega 3 (Alpha Linolenic Acid) A	0.02 %
C18:3 Omega 6 (Gamma Linolenic Acid) A	0.02 %
C18:3, Total (Linolenic Acid + isomers) A	0.02 %
C18:4 Omega 3 (Octadecatetraenoic Acid)	0.02 %
C18:4 Total (Octadecatetraenoic Acid) A	0.02 %
C20:0 (Arachidic Acid) A	0.02 %
C20:1 Omega 9 (Gondoic Acid) A	0.02 %
C20:1 Total (Gondoic Acid + isomers) A	0.02 %
C20:2 Omega 6 A	0.02 %
C20:2 Total (Eicosadienoic Acid) A	0.02 %
C20:3 Omega 3 A	0.02 %
C20:3 Omega 6 A	0.02 %
C20:3, Total (Eicosatrienoic Acid) A	0.02 %
C20:4 Omega 3 A	0.02 %
C20:4 Omega 6 (Arachidonic Acid) A	0.02 %
C20:4, Total (Eicosatetraenoic Acid) A	0.02 %
C20:5 Omega 3 (Eicosapentaenoic Acid)	0.02 %
C21:5 Omega 3 (Heneicosapentaenoic Ac A	0.02 %
C22:0 (Behenic Acid) A	0.02 %
C22:1 Omega 9 (Erucic Acid) A	0.02 %
C22:1 Total (Erucic Acid + isomers) A	0.02 %
C22:2 Docosadienoic Omega 6 A	0.02 %
C22:3 Docosatrienoic, Omega 3 A	0.02 %
C22:4 Docosatetraenoic Omega 6 A	0.02 %
C22:5 Docosapentaenoic Omega 3 A	0.02 %
C22:5 Docosapentaenoic Omega 6 A	0.02 %
C22:5 Total (Docosapentaenoic Acid) A	0.02 %
C22:6 Docosahexaenoic Omega 3 A	0.02 %
C24:0 (Lignoceric Acid) A	0.02 %
C24:1 Omega 9 (Nervonic Acid) A	0.02 %
C24:1 Total (Nervonic Acid + isomers) A	0.02 %
Total Omega 3 Isomers A	0.05 %
Total Omega 5 Isomers A	0.05 %

(b) (4)

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-24-YI-001114-01

Received On: 15Feb2024

Reported On: 28Feb2024

(b) (4) 129-2024-02150036

Sample Registration Date: 15Feb2024

Client Sample Code: 05/C-003-IPD

Condition Upon Receipt: acceptable, 20.3°C

Sample Description: Oleorresina Saponificada NT

Sample Reference: 05/C-003-IPD After Saponification

QD05C - Fatty Acids-Full Omega 9,6&3 & Trans %W/W

Accreditation

Completed
28Feb2024

Sub
1

Parameter	LOQ
Total Omega 6 Isomers A	0.05 %
Total Omega 7 Isomers A	0.05 %
Total Omega 9 Isomers A	0.05 %
Total Monounsaturated Fatty Acids A	0.05 %
Total Polyunsaturated Fatty Acids A	0.05 %
Total Saturated Fatty Acids A	0.05 %
Total Trans Fatty Acids A	0.02 %
Total Fat as Triglycerides A	0.1 %
Total Fatty Acids A	0.1 %
Fatty Acid Profile B	
C4:0 (Butyric Acid) B	0.02 %
C6:0 (Caproic acid) B	0.02 %
C8:0 (Caprylic acid) B	0.02 %
C10:0 (Capric acid) B	0.02 %
C11:0 (Undecanoic acid) B	0.02 %
C12:0 (Lauric Acid) B	0.02 %
C14:0 (Myristic acid) B	0.02 %
C14:1 (Myristoleic acid) B	0.02 %
C15:0 (Pentadecanoic acid) B	0.02 %
C15:1 (Pentadecenoic acid) B	0.02 %
C16:0 (Palmitic Acid) B	0.02 %
C16:1 Omega 7 B	0.04 %
C16:1 Total (Palmitoleic Acid + isomers)	0.04 %
C16:2 (Hexadecadienoic Acid) B	0.02 %
C16:3 (Hexadecatrienoic Acid) B	0.02 %
C 16:4 (Hexadecatetraenoic Acid) B	0.02 %
C17:0 (Margaric Acid) B	0.02 %
C17:1 (Heptadecenoic Acid) B	0.02 %
C18:0 (Stearic Acid) B	0.02 %
C18:1 (Vaccenic acid) B	0.03 %
C18:1 Omega 9 (Oleic Acid) B	0.02 %
C18:1, Total (Oleic Acid + isomers) B	0.03 %
C18:2 Omega 6 (Linoleic Acid) B	0.02 %
C18:2, Total (Linoleic Acid + isomers) B	0.02 %

(b) (4)

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-24-YI-001114-01

Received On: 15Feb2024

Reported On: 28Feb2024

(b) (4)

129-2024-02150036

Sample Registration Date: 15Feb2024

Client Sample Code: 05/C-003-IPD

Condition Upon Receipt: acceptable, 20.3°C

Sample Description: Oleorresina Saponificada NT

Sample Reference: 05/C-003-IPD After Saponification

QD05C - Fatty Acids-Full Omega 9,6&3 & Trans %W/W

mod.

Accreditation

Completed
28Feb2024

Sub
1

Parameter	LOQ
C18:3 Omega 3 (Alpha Linolenic Acid) B	0.02 %
C18:3 Omega 6 (Gamma Linolenic Acid) B	0.02 %
C18:3, Total (Linolenic Acid + isomers) B	0.02 %
C18:4 Omega 3 (Octadecatetraenoic Acid)	0.02 %
C18:4 Total (Octadecatetraenoic Acid) B	0.02 %
C20:0 (Arachidic Acid) B	0.02 %
C20:1 Omega 9 (Gondoic Acid) B	0.02 %
C20:1 Total (Gondoic Acid + isomers) B	0.02 %
C20:2 Omega 6 B	0.02 %
C20:2 Total (Eicosadienoic Acid) B	0.02 %
C20:3 Omega 3 B	0.02 %
C20:3 Omega 6 B	0.02 %
C20:3, Total (Eicosatrienoic Acid) B	0.02 %
C20:4 Omega 3 B	0.02 %
C20:4 Omega 6 (Arachidonic Acid) B	0.02 %
C20:4, Total (Eicosatetraenoic Acid) B	0.02 %
C20:5 Omega 3 (Eicosapentaenoic Acid) B	0.02 %
C21:5 Omega 3 (Heneicosapentaenoic Acid) B	0.02 %
C22:0 (Behenic Acid) B	0.02 %
C22:1 Omega 9 (Erucic Acid) B	0.02 %
C22:1 Total (Erucic Acid + isomers) B	0.02 %
C22:2 Docosadienoic Omega 6 B	0.02 %
C22:3 Docosatrienoic, Omega 3 B	0.02 %
C22:4 Docosatetraenoic Omega 6 B	0.02 %
C22:5 Docosapentaenoic Omega 3 B	0.02 %
C22:5 Docosapentaenoic Omega 6 B	0.02 %
C22:5 Total (Docosapentaenoic Acid) B	0.02 %
C22:6 Docosahexaenoic Omega 3 B	0.02 %
C24:0 (Lignoceric Acid) B	0.02 %
C24:1 Omega 9 (Nervonic Acid) B	0.02 %
C24:1 Total (Nervonic Acid + isomers) B	0.02 %
Total Omega 3 Isomers B	0.05 %
Total Omega 5 Isomers B	0.05 %

(b) (4)

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-24-YI-001114-01

Received On: 15Feb2024

Reported On: 28Feb2024

(b) (4)

129-2024-02150036

Sample Registration Date: 15Feb2024

Client Sample Code: 05/C-003-IPD

Condition Upon Receipt: acceptable, 20.3°C

Sample Description: Oleoresina Saponificada NT

Sample Reference: 05/C-003-IPD After Saponification

QD05C - Fatty Acids-Full Omega 9,6&3 & Trans %W/W	e	Accreditation	Completed	Sub
	6.06 mod.		28Feb2024	1

Parameter	Result	LOQ
Total Omega 6 Isomers B	(b) (4)	0.05 %
Total Omega 7 Isomers B	(b) (4)	0.05 %
Total Omega 9 Isomers B	(b) (4)	0.05 %
Total Monounsaturated Fatty Acids B	(b) (4)	0.05 %
Total Polyunsaturated Fatty Acids B	(b) (4)	0.05 %
Total Saturated Fatty Acids B	(b) (4)	0.05 %
Total Trans Fatty Acids B	(b) (4)	0.02 %
Total Fat as Triglycerides B	(b) (4)	0.1 %
Total Fatty Acids B	(b) (4)	0.1 %

QD148 - Moisture by Vacuum Oven	e	Accreditation	Completed	Sub
	5.09		28Feb2024	1

Parameter	Result	LOQ
Moisture and Volatiles - Vacuum Oven A	(b) (4)	0.5 %
Moisture and Volatiles - Vacuum Oven B	(b) (4)	0.5 %

QD681 - Ash - (liquids, oils, fats, low level)	Reference	Accreditation	Completed	Sub
	AOAC 942.05		28Feb2024	1

Parameter	Result	LOQ
Ash A	(b) (4)	0.05 %
Ash B	(b) (4)	0.05 %

TKI06 - Lutein From Tagetes Erecta by JECFA	Accreditation	Completed	Sub
		27Feb2024	2

Parameter	Result
Solubility A	(b) (4)
Spectrophotometry A	(b) (4)
Test for Carotenoids A	(b) (4)
Moisture A	(b) (4)
Ash A	(b) (4)
Zeaxanthin A	(b) (4)
Methanol A	(b) (4)
Propylene Glycol A	(b) (4)
Waxes A	(b) (4)
Assay, Carotenoids A	(b) (4)

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-24-YI-001114-01

Received On: 15Feb2024

Reported On: 28Feb2024

(b) (4)

129-2024-02150036

Sample Registration Date: 15Feb2024

Client Sample Code: 05/C-003-IPD

Condition Upon Receipt: acceptable, 20.3°C

Sample Description: Oleorresina Saponificada NT

Sample Reference: 05/C-003-IPD After Saponification

TKI06 - Lutein From Tagetes Erecta by JECFA

Accreditation

Completed
27Feb2024

Sub
2

Parameter

- Assay, Lutein A
- Solubility B
- Spectrophotometry B
- Test for Carotenoids B
- Moisture B
- Ash B
- Zeaxanthin B
- Methanol B
- Propylene Glycol B
- Waxes B
- Assay, Carotenoids B
- Assay, Lutein B

(b) (4)

YI004 - Carotenoid Profile

HPLC) - ECT

Completed
28Feb2024

Parameter

- Alpha-carotene A
- cis-beta-Carotene A
- trans-beta-Carotene A
- Total beta-Carotene A
- alpha-Cryptoxanthin A
- (all-E)-β-Cryptoxanthin A
- Gamma-Carotene A
- cis-Lycopene A
- trans-Lycopene A
- Total Lycopene A
- Lutein A
- Zeaxanthin A
- Total carotenoids A
- Alpha-carotene B
- cis-beta-Carotene B
- trans-beta-Carotene B
- Total beta-Carotene B
- alpha-Cryptoxanthin B
- (all-E)-β-Cryptoxanthin B

(b) (4)

LOQ

- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g
- 0.03 µg/g

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-24-YI-001114-01

Received On: 15Feb2024

Reported On: 28Feb2024

(b) (4)

129-2024-02150036

Sample Registration Date: 15Feb2024

Client Sample Code: 05/C-003-IPD

Condition Upon Receipt: acceptable, 20.3°C

Sample Description: Oleoresina Saponificada NT

Sample Reference: 05/C-003-IPD After Saponification

YI004 - Carotenoid Profile

d (HPLC) - ECT

Completed
28Feb2024

Parameter		LOQ
Gamma-Carotene B	(b) (4)	0.03 µg/g
cis-Lycopene B	(b) (4)	0.03 µg/g
trans-Lycopene B	(b) (4)	0.03 µg/g
Total Lycopene B	(b) (4)	0.03 µg/g
Lutein B	(b) (4)	0.03 µg/g
Zeaxanthin B	(b) (4)	0.03 µg/g
Total carotenoids B	(b) (4)	0.03 µg/g

Subcontracting partners:

- 1 - (b) (4)
- 2 - (b) (4)

(b) (6)

for analysis. | Any opinions/interpretations expressed on this report are given independent of the laboratory's scope of accreditation. | All results are reported on an "As Received" basis unless otherwise stated. | Reports shall not be reproduced except in full without written permission of (b) (4) | All work done in accordance with (b) (4) General Terms and Conditions of Sale: (b) (4) | √ Indicates a subcontract test to a different lab. Lab(s) are listed at end of the report. For further details about the performing labs please contact your customer service contact at (b) (4) Measurement of uncertainty can be obtained upon request.

(b) (4)

(b) (4), (b) (6)

CERTIFICATE OF ANALYSIS

Product Description: (b) (4) Dry
Product Number: (b) (4)
Lot Number: (b) (4)
Manufacturing Date: (YYYY-MM-DD) 2023-02-14
Expiration Date: (YYYY-MM-DD) 2024-02-13

Country of Origin: United States

ANALYSIS REPORT

COMPONENT

METHOD

SPECIFICATION

RESULT

Particle Size on US#20 Mesh
Odor
Color
Xanthophylls

(b) (4)

MIN MAX

0.0 - 2.0 %

Herbal

Orange to Brown

45.0 - 49.0 g/kg

(b) (4)

We hereby certify that the above product lot of (b) (4) Dry is manufactured under strict quality control standards, has been analyzed, and has passed all quality control test qualifications.

Quality Control Approver: _____

(b) (6)

Date: 2023-02-08

Quality Assurance Approver: _____

Date: 2023-02-16

Modified Final Report 1031679-2 supercedes 1031679-1

(b) (4)

(b) (4), (b) (6)

CERTIFICATE OF ANALYSIS

Product Description: (b) (4) Dry
Product Number: (b) (4)
Lot Number: (b) (4)
Manufacturing Date: (YYYY-MM-DD) 2023-02-12
Expiration Date: (YYYY-MM-DD) 2024-02-11

Country of Origin: United States

ANALYSIS REPORT

COMPONENT

METHOD

SPECIFICATION

RESULT

Particle Size on US#20 Mesh
Odor
Color
Xanthophylls

(b) (4)

MIN MAX

0.0 - 2.0 %

Herbal

Orange to Brown

45.0 - 49.0 g/kg

(b) (4)

We hereby certify that the above product lot of (b) (4) Dry is manufactured under strict quality control standards, has been analyzed, and has passed all quality control test qualifications.

Quality Control Approver:

(b) (6)

Date: 2023-02-09

Quality Assurance Approver:

Date: 2023-02-15

Modified Final Report 1031609-2 supercedes 1031609-1

(b) (4)

(b) (4), (b) (6)

CERTIFICATE OF ANALYSIS

Product Description: (b) (4) Dry
Product Number: (b) (4)
Lot Number: (b) (4)
Manufacturing Date: (YYYY-MM-DD) 2023-07-06
Expiration Date: (YYYY-MM-DD) 2024-07-05

Country of Origin: United States

ANALYSIS REPORT

<u>COMPONENT</u>	<u>METHOD</u>	<u>SPECIFICATION</u>		<u>RESULT</u>
		MIN	MAX	
Odor	(b) (4)		Herbal	(b) (4)
Color			Orange to Brown	
Xanthophylls			45.0 - 49.0 g/kg	
Particle Size on US#20 Mesh			0.0 - 2.0 %	

We hereby certify that the above product lot of (b) (4) Dry is manufactured under strict quality control standards, has been analyzed, and has passed all quality control test qualifications.

Quality Control Approver: (b) (6) **Date:** 2023-07-05

Quality Assurance Approver: (b) (6) **Date:** 2023-07-07

Rev. Level: 1038562-1

(b) (4)

CERTIFICATE OF ANALYSIS
(Certificate of Analysis)

Code	F-PE-CC-P-001-001-001
Version	01
Approved by	(b) (6)
Date of approval	19/02/2020

Description SAP Code : GP GOLD 20 NATURAL (EXT.SAPONIF.MARIGOLD) Date of manufacture (Manufacture date) : 23.02.2024
(Code) Manufacturer : 100000964 Expiration date (Exiration date) : 23.08.2025
Country of origin (Country of origin) Lot (Lot) : (b) (4) : 40000049052
: (b) (6) Analysis date : 23.08.2025
: 08/E-4221 Date of issue : 28.08.2025

RESULTADOS DE ANALISIS / RESULTS OF ANALYSIS

Characteristic	Specification (Specification)	Results (Results)	Unit of Measurement (Measurement Unit)
Appearance and dispersion	Flowable homogeneous granular powder	(b) (4)	-
Color	Yellow to dark yellow		-
Xanthophyll	20.00 - 20.50 g/Kg		g / kg
Lutein	≥ 80.00 %		%
Zeaxanthin	≥ 4.00 %		%
Saponification	≥ 95.00 %		%
Moisture	≤ 10.00 %		%
Ethoxyquin	≤ 2.00 ppm		ppm
Tocopherol	≥ 3000.00 ppm		ppm
Density	0.98 - 1.40 g/cm3		g/cm3

(b) (4), (b) (6)

(b) (4)

CERTIFICATE OF ANALYSIS
(Certificate of Analysis)

Code	F-PE-CC-P-001-001-001
Version	01
Approved by	P. Morlaya
Date of approval	19/02/2020

Description SAP Code	: (b) (4) DRY NATURAL	Date of manufacture date	: 18.05.2024
(Code) Manufacturer	: 100000984	Expiration date	: 18.11.2025
Country of origin (Country of origin) Lot (Lot)	: (b) (4)	Inspection Lot (Inspection Lot)	: 40000050582
	: (b) (6)	Analysis date	: 18.05.2024
	: 20/N-4284	Date of issue	: 30.05.2024

RESULTADOS DE ANALISIS / RESULTS OF ANALYSIS

Characteristic	Specification (Specification)	Results (Results)	Unit of Measurement (Measurement Unit)
Appearance and dispersion	Flowable homogeneous granular powder	According to	-
Color	Yellow to dark yellow	According to	-
Xanthophyll	20.00 - 20.50 g/kg	(b) (4)	g / kg
Lutein	≥ 80.00 %		%
Zeaxanthin	≥ 4.00 %		%
Saponification	≥ 95.00 %		%
Humidity	≤ 10.00 %		%
Residual Ethoxyquin	≤ 2.00 ppm		ppm
Tocopherol	≥ 3000.00 ppm		ppm
Residual Density	0.80 - 1.40 g/cm3		g/cm3

(b)(6)

(b) (4)

**CERTIFICATE OF ANALYSIS
(Certificate of Analysis)**

Code	F-PE-CC-P-001-001-001
Version	01
Approved by	P. Montoya
Date of approval	19/02/2020

Description SAP Code : [REDACTED] DRY NATURAL Date of manufacture (Manufacture date) : 23.11.2023
(Code) Manufacturer : 100000984 Expiration date (Expiration date) : 23.05.2025
Country of origin (Country of origin) Lot (Lot) : [REDACTED] (b) (4) : 40000047127
: (b) (6) Analysis date : 23.11.2023
: 46/D-4116 Date of issue : 27.11.2023

RESULTADOS DE ANALISIS / RESULTS OF ANALYSIS

Characteristic	Specification (Specification)	Results (Results)	Unit of Measurement (Measurement Unit)
Appearance and dispersion Color	Flowable homogeneous granular powder	According to	-
Xanthophyll	Yellow to dark yellow	According to	-
Lutein	20.00 - 20.50 g/Kg	(b) (4)	g / kg
Zeaxanthin	≥ 80.00 %	[REDACTED]	%
Saponification	≥ 4.00 %	[REDACTED]	%
Humidity	≥ 95.00 %	[REDACTED]	%
Residual Ethoxyquin	≤ 10.00 %	[REDACTED]	%
Tocopherol	≤ 2.00 ppm	[REDACTED]	ppm
Residual	≥ 3000.00 ppm	[REDACTED]	ppm
Density	0.98 - 1.40 g/cm3	[REDACTED]	g/cm3

(b)(6)

(b) (4)

(b) (4), (b) (6)

(b) (4), (b) (6)

ANALYTICAL REPORT

AR-21-JD-075877-02
Report Supersedes AR-21-JD-075877-01

Reported On: 24Sep2021

(b) (4)	473-2021-08240400	Sample Registration Date: 24Aug2021	
Client Sample Code: 210801131		Condition Upon Receipt: acceptable, 25°C	
Sample Description: (b) (4) Dry		Sample Reference:	
QA05R - Pesticides (Quechers LC-MSMS)		Completed 13Sep2021	Sub 2

Parameter

- Amitraz
- Azoxystrobin
- Carbendazim/Benomyl (sum)
- Propargite
- Tebuconazole
- Other screened pesticides

(b) (4)

QA101 - Aflatoxin B1 B2 G1 G2 (LC-MSMS)		Accreditation ISO/IEC 17025:2017 A2LA 2993.01	Completed 13Sep2021	Sub 2
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Parameter

- Aflatoxin B1
- Aflatoxin B2
- Aflatoxin G1
- Aflatoxin G2
- Aflatoxins total
- Adjusted LOQ for this matrix.

(b) (4)

QA315 - Hexane, residual (GC)	R USP/NF 467	Completed 13Sep2021	Sub 2
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Parameter

- n-Hexane

Result
(b) (4)

(b) (4), (b) (6)

ANALYTICAL REPORT

AR-21-JD-075877-02
Report Supersedes AR-21-JD-075877-01

Client Code: JD0000101
PO#: JLeutscher Marigold
Received On: 24Aug2021
Reported On: 24Sep2021

(b) (4)	473-2021-08240400	Sample Registration Date: 24Aug2021		
Client Sample Code: 210801131		Condition Upon Receipt: acceptable, 25°C		
Sample Description: (b) (4) Dry		Sample Reference:		
QA404 - Ochratoxin A (LC-MSMS)	Reference AOAC 999.07 Modified	Accreditation ISO/IEC 17025:2017 A2LA 2993.01	Completed 13Sep2021	Sub 2

Parameter
Ochratoxin A
Adjusted LOQ for this matrix.

Result
(b) (4)

QD06Q - Arsenic (Mwd-ICP-MS)	Reference J. AOAC vol. 90 (2007) 844-856 (Mod)	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 27Aug2021	Sub 1
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Parameter
Arsenic (As)

Result
(b) (4)

QD06R - Mercury (Mwd-ICP-MS, Most Matrices)	Reference J. AOAC vol. 90 (2007) 844-856 (Mod)	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 27Aug2021	Sub 1
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Parameter
Mercury (Hg)

Result
(b) (4)

QD06S - Lead (Mwd-ICP-MS)	Reference J. AOAC vol. 90 (2007) 844-856 (Mod)	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 27Aug2021	Sub 1
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Parameter
Lead (Pb)

Result
(b) (4)

QD06T - Cadmium (Mwd-ICP-MS)	Reference J. AOAC vol. 90 (2007) 844-856 (Mod)	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 27Aug2021	Sub 1
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Parameter
Cadmium (Cd)

Result
(b) (4)

QL005 - Dioxins and Furans: PCDD/F (17 Congeners)	R ober 1994	Completed 24Sep2021	Sub 3
--	-----------------------	-------------------------------	-----------------

Parameter
2,3,7,8-TetraCDD
2,3,7,8-TetraCDF
1,2,3,7,8-PentaCDD
1,2,3,7,8-PentaCDF
2,3,4,7,8-PentaCDF

Result
(b) (4)

(b) (4), (b) (6)

ANALYTICAL REPORT

AR-21-JD-075877-02
Report Supersedes AR-21-JD-075877-01

Client Code: JD0000101
PO#: JLeutscher Marigold
Received On: 24Aug2021
Reported On: 24Sep2021

(b) (4)	473-2021-08240400 801131	Sample Registration Date: 24Aug2021 Condition Upon Receipt: acceptable, 25°C
Sample Description:	(b) (4) Dry	Sample Reference:
QL005 - Dioxins and Furans: PCDD/F (17 Congeners)	R er 1994	Completed 24Sep2021 Sub 3

Parameter

- 1,2,3,4,7,8-HexaCDD
- 1,2,3,6,7,8-HexaCDD
- 1,2,3,7,8,9-HexaCDD
- 1,2,3,4,7,8-HexaCDF
- 1,2,3,6,7,8-HexaCDF
- 1,2,3,7,8,9-HexaCDF
- 2,3,4,6,7,8-HexaCDF
- 1,2,3,4,6,7,8-HeptaCDD
- 1,2,3,4,6,7,8-HeptaCDF
- 1,2,3,4,7,8,9-HeptaCDF
- OctaCDD
- OctaCDF
- WHO(2005)-PCDD/F TEQ (lower-bound)
- WHO(2005)-PCDD/F TEQ (upper-bound)

(b) (4)

UMR6Z - Salmonella spp. - FDA BAM Chapter 5	F er 5	Accreditation ISO/IEC 17025:2017 A2LA 3329.01	Completed 27Aug2021
--	-----------	--	-------------------------------

Parameter	Result
Salmonella spp.	Not Detected per 25 g

Comments:
Version 2: Corrected report issued to contain total TEQ values.

Subcontracting partners:

- 1- (b) (4)
- 2- (b) (4)
- 3- (b) (4)

(b) (4), (b) (6)

ANALYTICAL REPORT

AR-21-JD-075877-02
Report Supersedes AR-21-JD-075877-01

Client Code: JD0000101
PO#: JLeutscher Marigold

Received On: 24Aug2021
Reported On: 24Sep2021

(b)(6)

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(b) (4)

(b) (4), (b) (6)

(b) (4), (b) (6)

ANALYTICAL REPORT

AR-21-JD-075878-02
Report Supersedes AR-21-JD-075878-01

Received On: 24Aug2021
Reported On: 24Sep2021

(b) (4)	: 473-2021-08240401	Sample Registration Date: 24Aug2021	
Client Sample Code: 210871361		Condition Upon Receipt: acceptable, 25°C	
Sample Description: (b) (4)		Sample Reference:	
QA05R - Pesticides (Quechers LC-MSMS)		Completed	Sub
		13Sep2021	2

Parameter

- Amitraz
- Azoxystrobin
- Carbendazim/Benomyl (sum)
- Propargite
- Other screened pesticides

(b) (4)

QA101 - Aflatoxin B1 B2 G1 G2 (LC-MSMS)		Accreditation	Completed	Sub
		ISO/IEC 17025:2017 A2LA 2993.01	13Sep2021	2

Parameter

- Aflatoxin B1
- Aflatoxin B2
- Aflatoxin G1
- Aflatoxin G2
- Aflatoxins total
- Adjusted LOQ for this matrix.

(b) (4)

QA315 - Hexane, residual (GC)	R		Completed	Sub
	USP/NF 467		13Sep2021	2

Parameter

- n-Hexane

Result

(b) (4)

QA404 - Ochratoxin A (LC-MSMS)	Reference	Accreditation	Completed	Sub
	AOAC 999.07 Modified	ISO/IEC 17025:2017 A2LA 2993.01	13Sep2021	2

(b) (4), (b) (6)

Client Code: JD0000101

PO#: JLeutscher Marigold

Received On: 24Aug2021

Reported On: 24Sep2021

ANALYTICAL REPORT

AR-21-JD-075878-02

Report Supersedes AR-21-JD-075878-01

(b) (4)	e: 473-2021-08240401	Sample Registration Date: 24Aug2021		
Client Sample Code: 210871361		Condition Upon Receipt: acceptable, 25°C		
Sample Description: (b) (4)		Sample Reference:		
QA404 - Ochratoxin A (LC-MSMS)	Reference AOAC 999.07 Modified	Accreditation ISO/IEC 17025:2017 A2LA 2993.01	Completed 13Sep2021	Sub 2

Parameter
Ochratoxin A
Adjusted LOQ for this matrix.

Result
(b) (4)

QD06Q - Arsenic (Mwd-ICP-MS)	Reference J. AOAC vol. 90 (2007) 844-856 (Mod)	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 27Aug2021	Sub 1
-------------------------------------	--	--	-------------------------------	-----------------

Parameter
Arsenic (As)

Result
(b) (4)

QD06R - Mercury (Mwd-ICP-MS, Most Matrices)	Reference J. AOAC vol. 90 (2007) 844-856 (Mod)	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 27Aug2021	Sub 1
--	--	--	-------------------------------	-----------------

Parameter
Mercury (Hg)

Result
(b) (4)

QD06S - Lead (Mwd-ICP-MS)	Reference J. AOAC vol. 90 (2007) 844-856 (Mod)	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 27Aug2021	Sub 1
----------------------------------	--	--	-------------------------------	-----------------

Parameter
Lead (Pb)

Result
(b) (4)

QD06T - Cadmium (Mwd-ICP-MS)	Reference J. AOAC vol. 90 (2007) 844-856 (Mod)	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 27Aug2021	Sub 1
-------------------------------------	--	--	-------------------------------	-----------------

Parameter
Cadmium (Cd)

Result
(b) (4)

QL005 - Dioxins and Furans: PCDD/F (17 Congeners)	ber 1994	Completed 24Sep2021	Sub 3
--	----------	-------------------------------	-----------------

Parameter
2,3,7,8-TetraCDD
2,3,7,8-TetraCDF
1,2,3,7,8-PentaCDD
1,2,3,7,8-PentaCDF
2,3,4,7,8-PentaCDF

(b) (4)

(b) (4), (b) (6)

ANALYTICAL REPORT

AR-21-JD-075878-02
Report Supersedes AR-21-JD-075878-01

Client Code: JD0000101
PO#: JLeutscher Mariqold
Received On: 24Aug2021
Reported On: 24Sep2021

(b) (4)	: 473-2021-08240401	Sample Registration Date: 24Aug2021
Client Sample Code: 210871361		Condition Upon Receipt: acceptable, 25°C
Sample Description: (b) (4)		Sample Reference:
QL005 - Dioxins and Furans: PCDD/F (17 Congeners)	er 1994	Completed 24Sep2021 Sub 3

Parameter

- 1,2,3,4,7,8-HexaCDD
- 1,2,3,6,7,8-HexaCDD
- 1,2,3,7,8,9-HexaCDD
- 1,2,3,4,7,8-HexaCDF
- 1,2,3,6,7,8-HexaCDF
- 1,2,3,7,8,9-HexaCDF
- 2,3,4,6,7,8-HexaCDF
- 1,2,3,4,6,7,8-HeptaCDD
- 1,2,3,4,6,7,8-HeptaCDF
- 1,2,3,4,7,8,9-HeptaCDF
- OctaCDD
- OctaCDF
- WHO(2005)-PCDD/F TEQ (lower-bound)
- WHO(2005)-PCDD/F TEQ (upper-bound)

(b) (4)

UMR6Z - Salmonella spp. - FDA BAM Chapter 5	er 5	Accreditation ISO/IEC 17025:2017 A2LA 3329.01	Completed 27Aug2021
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Parameter	Result
Salmonella spp.	Not Detected per 25 g

Comments:
Version 2: Corrected report issued to contain total TEQ values.

Subcontracting partners:

1 (b) (4)
2
3

(b) (4)

ANALYTICAL REPORT

AR-21-JD-075878-02
Report Supersedes AR-21-JD-075878-01

Client Code: JD0000101
PO#: JLeutscher Marigold

Received On: 24Aug2021
Reported On: 24Sep2021

(b)(6)

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(b) (4)

(b) (4), (b) (6)

(b) (4), (b) (6)

ANALYTICAL REPORT

AR-21-JD-075879-02
Report Supersedes AR-21-JD-075879-01

Received On: 24Aug2021
Reported On: 24Sep2021

(b) (4) Sample Code: 473-2021-08240402	Sample Registration Date: 24Aug2021
Client Sample Code: 210891931	Condition Upon Receipt: acceptable, 25°C
Sample Description: (b) (4)	Sample Reference:
QA05R - Pesticides (Quechers LC-MSMS) R	Completed Sub 13Sep2021 2

Parameter

- Amitraz
- Azoxystrobin
- Carbendazim/Benomyl (sum)
- Propargite
- Tebuconazole
- Other screened pesticides

(b) (4)

QA101 - Aflatoxin B1 B2 G1 G2 (LC-MSMS)	Accreditation ISO/IEC 17025:2017 A2LA 2993.01	Completed 13Sep2021	Sub 2
--	--	-------------------------------	-----------------

Parameter

- Aflatoxin B1
- Aflatoxin B2
- Aflatoxin G1
- Aflatoxin G2
- Aflatoxins total
- Adjusted LOQ for this matrix.

(b) (4)

QA315 - Hexane, residual (GC)	USP/NF 467	Completed 13Sep2021	Sub 2
--------------------------------------	------------	-------------------------------	-----------------

Parameter

- n-Hexane

Result
(b) (4)

(b) (4), (b) (6)

Client Code: JD0000101

PO#: JLeutscher Marigold

Received On: 24Aug2021

Reported On: 24Sep2021

ANALYTICAL REPORT

AR-21-JD-075879-02

Report Supersedes AR-21-JD-075879-01

(b) (4)	: 473-2021-08240402	Sample Registration Date: 24Aug2021
Client Sample Code: 210891931		Condition Upon Receipt: acceptable, 25°C
Sample Description: (b) (4)		Sample Reference:

QA404 - Ochratoxin A (LC-MSMS)	Reference AOAC 999.07 Modified	Accreditation ISO/IEC 17025:2017 A2LA 2993.01	Completed 13Sep2021	Sub 2
---------------------------------------	--	--	-------------------------------	-----------------

Parameter
Ochratoxin A
Adjusted LOQ for this matrix.

Result
(b) (4)

QD06Q - Arsenic (Mwd-ICP-MS)	Reference J. AOAC vol. 90 (2007) 844-856 (Mod)	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 27Aug2021	Sub 1
-------------------------------------	--	--	-------------------------------	-----------------

Parameter
Arsenic (As)

Result
(b) (4)

QD06R - Mercury (Mwd-ICP-MS, Most Matrices)	Reference J. AOAC vol. 90 (2007) 844-856 (Mod)	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 27Aug2021	Sub 1
--	--	--	-------------------------------	-----------------

Parameter
Mercury (Hg)

Result
(b) (4)

QD06S - Lead (Mwd-ICP-MS)	Reference J. AOAC vol. 90 (2007) 844-856 (Mod)	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 27Aug2021	Sub 1
----------------------------------	--	--	-------------------------------	-----------------

Parameter
Lead (Pb)

Result
(b) (4)

QD06T - Cadmium (Mwd-ICP-MS)	Reference J. AOAC vol. 90 (2007) 844-856 (Mod)	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 27Aug2021	Sub 1
-------------------------------------	--	--	-------------------------------	-----------------

Parameter
Cadmium (Cd)

Result
(b) (4)

QL005 - Dioxins and Furans: PCDD/F (17 Congeners)	R E ober 1994	Completed 24Sep2021	Sub 3
--	--------------------------------	-------------------------------	-----------------

Parameter
2,3,7,8-TetraCDD
2,3,7,8-TetraCDF
1,2,3,7,8-PentaCDD
1,2,3,7,8-PentaCDF
2,3,4,7,8-PentaCDF

(b) (4)

(b) (4), (b) (6)

ANALYTICAL REPORT

AR-21-JD-075879-02
Report Supersedes AR-21-JD-075879-01

Client Code: JD0000101
PO#: JLeutscher Marigold
Received On: 24Aug2021
Reported On: 24Sep2021

(b) (4)	e: 473-2021-08240402	Sample Registration Date: 24Aug2021
Client Sample Code: 210891931		Condition Upon Receipt: acceptable, 25°C
Sample Description: (b) (4)		Sample Reference:
QL005 - Dioxins and Furans: PCDD/F (17 Congeners)	R tober 1994	Completed 24Sep2021 Sub 3

Parameter

- 1,2,3,4,7,8-HexaCDD
- 1,2,3,6,7,8-HexaCDD
- 1,2,3,7,8,9-HexaCDD
- 1,2,3,4,7,8-HexaCDF
- 1,2,3,6,7,8-HexaCDF
- 1,2,3,7,8,9-HexaCDF
- 2,3,4,6,7,8-HexaCDF
- 1,2,3,4,6,7,8-HeptaCDD
- 1,2,3,4,6,7,8-HeptaCDF
- 1,2,3,4,7,8,9-HeptaCDF
- OctaCDD
- OctaCDF
- WHO(2005)-PCDD/F TEQ (lower-bound)
- WHO(2005)-PCDD/F TEQ (upper-bound)

(b) (4)

UMR6Z - Salmonella spp. - FDA BAM Chapter 5	F	apter 5	Accreditation ISO/IEC 17025:2017 A2LA 3329.01	Completed 30Aug2021
--	---	---------	--	-------------------------------

Parameter

- Salmonella spp.
- UV-

Result

Not Detected per 25 g

Comments:

Version 2: Corrected report issued to contain total TEQ values.

Subcontracting partners:

- 1 - (b) (4)
- 2 -
- 3 -

(b) (4), (b) (6)

ANALYTICAL REPORT

AR-21-JD-075879-02
Report Supersedes AR-21-JD-075879-01

Client Code: JD0000101
PO#: JLeutscher Marigold

Received On: 24Aug2021
Reported On: 24Sep2021

(b) (6)

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(b) (4)

Test Report No. 192374-03

DATA PROVIDED BY THE CUSTOMER

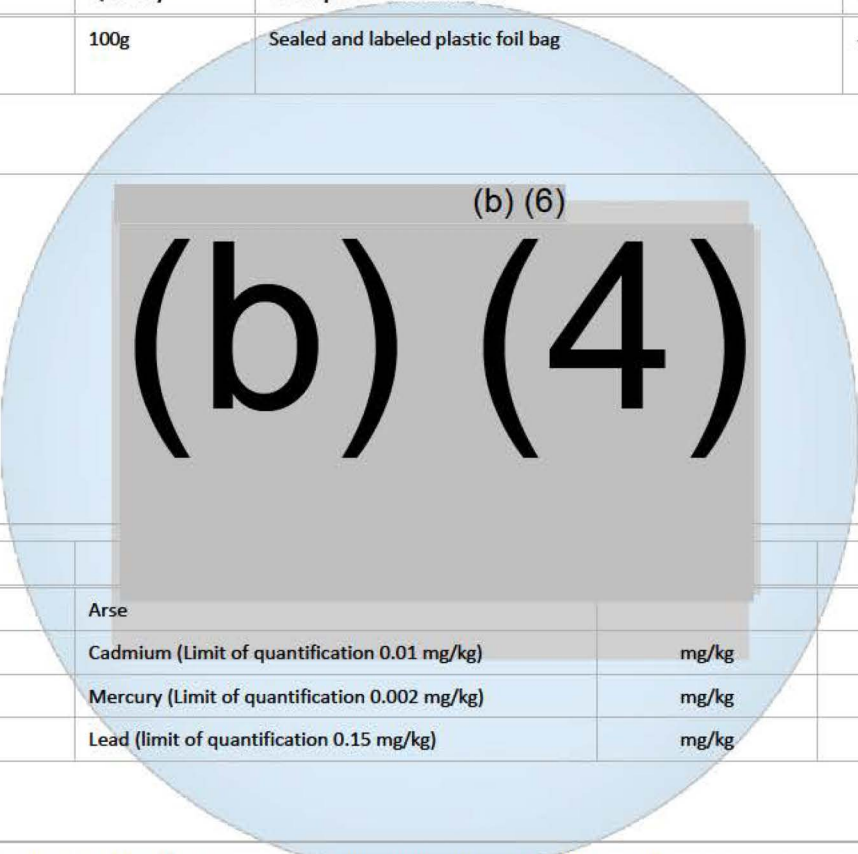
Applicant
Legal address
Contact
Delivery address
Product GP GOLD 20 NATURAL
Source Sample provided by Customer

(b) (4), (b) (6)

Table with 6 columns: Sample identification, Quantity, Description - Presentation, Seal, FP, FV. Row 1: GP GOLD 20 NATURAL, 100g, Sealed and labeled plastic foil bag, -, -, -.

SERVICE INFORMATION

Tests performed in
Date of receipt
Analysis Start Date
Date End Analysis
Reference
Internal laboratory coding:



RESULTS

Table with 4 columns: Sample identification, Description, Unit, Result. Rows for Arsenic, Cadmium, Mercury, and Lead.

Methods

Arsenic: AOAC 952.13 C39, Vol. I, p.28, 21th. Ed. 2019. Arsenic in Food. Silver Diethyldithiocarbamate Method.
Cadmium: NOM-117-SSA1 (1994). Test method for the determination of Cadmium, Arsenic, Lead, Tin, Copper, Iron, Zinc and Mercury in food, drinking water and purified water by spectrometry.
Mercury: NCh 2667. Of2001. Procedure B 2001 Hydrobiological products. Determination of mercury. Spectrophotometric method of atomic absorption by generation of cold vapor.
Lead: NOM-117-SSA1 (1994). Test method for the determination of Cadmium, Arsenic, Lead, Tin, Copper, Iron, Zinc and Mercury in food, drinking water and purified water by spectrometry.

Sampling is not part of the scope of accreditation of the (b) (4) testing laboratory.

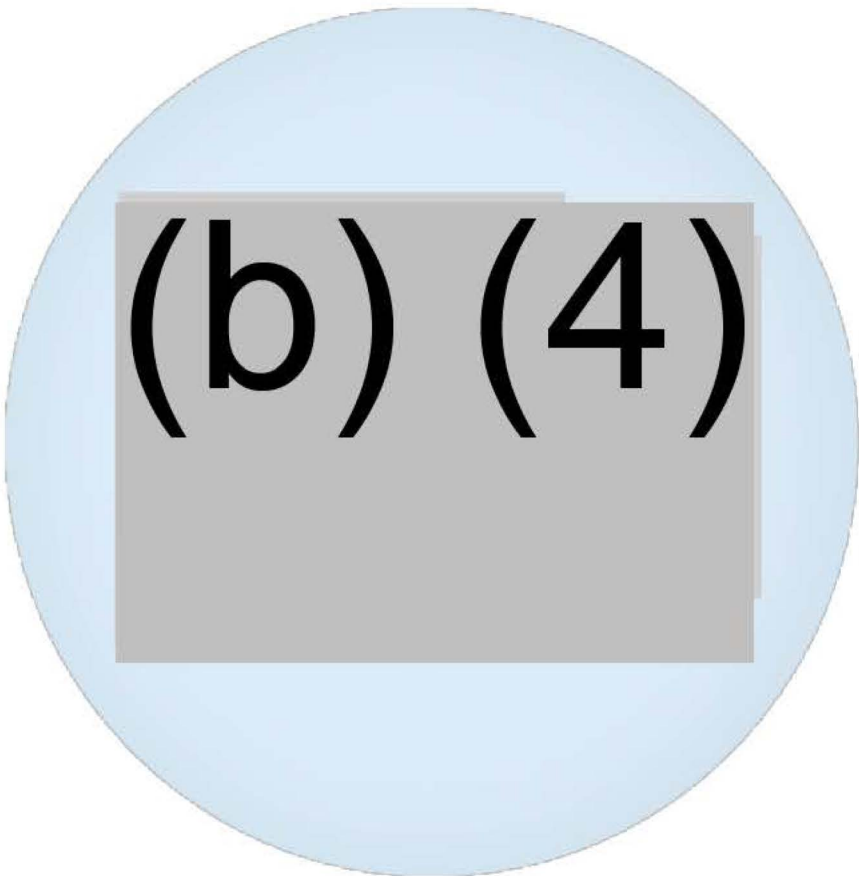
(b) (6)

(b) (4)

(b) (6)

(b) (6), January 31, 2022

————— End of document —————



(b) (4)

Test Report No. 204140-02

DATA PROVIDED BY THE CUSTOMER

Applicant
Legal address
Contact
Delivery address
Product GP GOLD 20 NATURAL
Source Sample provided by Customer

(b) (6)

Sample identification	Quantity	Description - Presentation	Seal	FP	FV
GP GOLD 20 NATURAL Lot: (b) (4)	200g and 150g	02 Sealed and identified sealed plastic aluminum envelopes	-	2023.02.02	-

SERVICE INFORMATION

Tests performed at
Date of receipt
Analysis Start Date
End Date Analysis
Reference
Internal laboratory coding:

(b) (6)

(b) (4)

RESULTS

Sample identification	Unit	Result
Lot: (b) (4)	mg/kg	(b) (4)
Cadmium (Limit of Quantification 0.01mg/Kg)	mg/kg	
Mercury (Limit of Quantification 0.002mg/Kg)	mg/kg	
Lead (Limit of Quantification 0.15mg/Kg)	mg/kg	

(**) Estimated value.

Methods

Arsénico: AOAC 952.13, C.9, Vol.I, p.28, 21 th. Ed. 2019 Arsenic in Food. Silver Diethyldithiocarbamate Method. Modified method.
Cadmium: NOM 117 - SSA1 (1994). Test method for the determination of Cadmium, Arsenic, Lead, Tin, Copper, Iron, Zinc and Mercury in food, drinking water and purified water by Atomic Absorption Spectrophotometry.
Mercury: NCh 2667. Of2001. Procedure B 2001 Hydrobiological products. Determination of mercury. Spectrophotometric method of atomic absorption by generation of cold vapor. Determination by means of an atomic absorption spectrophotometer equipped with a G
Lead: NOM 117 - SSA1 (1994). Test method for the determination of Cadmium, Arsenic, Lead, Tin, Copper, Iron, Zinc and Mercury in food, drinking water and purified water by Atomic Absorption Spectrophotometry.

Método out of reach

Sampling is not part of the scope of accreditation of the (b) (4) testing laboratory.

(b) (6)

(b) (4)

(b) (6)

End of document

(b) (4)

(b) (4)

Test Report No. 210346

DATA PROVIDED BY THE CUSTOMER

Applicant

Legal address

Contact

Delivery address

Product

Source

(b) (4), (b) (6)

(b) (4)

Sample provided by Customer

Sample identification	Quantity	Description - Presentation	Seal	FP	FV
(b) (4) Batch: (b) (4)	150g	Sealed and identified plasticized aluminum envelope	-	-	2023.11.10

SERVICE INFORMATION

Tests performed in

Date of receipt

Analysis Start Date

Date End Analysis

Reference

Internal laboratory coding:

(b) (6)

(b) (4)

RESULTS

Sample identification		Unit	Result
Lot: (b) (4)	Arsenic (Quantification Limit 0.10mg/Kg)	mg/kg	(b) (4)
	Cadmium (Limit of Quantification 0.01mg/Kg)	mg/kg	(b) (4)
	Mercury (Limit of Quantification 0.002mg/Kg)	mg/kg	(b) (4)
	Lead (Limit of Quantification 0.15mg/Kg)	mg/kg	(b) (4)

Methods

Arsenic: AOAC 952.13, C.9, Vol.I, p.28, 21 th. Ed. 2019 Arsenic in Food. Silver Diethyldithiocarbamate Method.

Cadmium: NOM 117 - SSA1 (1994). Test method for the determination of Cadmium, Arsenic, Lead, Tin, Copper, Iron, Zinc and Mercury in food, drinking water and purified water by Atomic Absorption Spectrophotometry.

Mercury: NCh 2667. Of2001. Procedure B 2001 Hydrobiological products. Determination of mercury. Spectrophotometric method of atomic absorption by generation of cold vapor. Determination by means of an Atomic Absorption Spectrophotometer equipped with a Hydride Generator.

Lead: NOM 117 - SSA1 (1994). Test method for the determination of Cadmium, Arsenic, Lead, Tin, Copper, Iron, Zinc and Mercury in food, drinking water and purified water by Atomic Absorption Spectrophotometry.

Sampling is not part of the scope of accreditation of the (b) (4) testing laboratory.

(b) (6)

(b) (4)

(b) (6)

————— End of document —————

(b) (4)

(b) (4)

TEST REPORT
IE-2024-0771

1. CUSTOMER DATA

1.1 Customer : (b) (4)
1.2 RUC or DNI : 20110200201
1.3 Address : (b) (6)

2. SAMPLE DATA

2.1 Product : INPUT / OUTPUT
2.2 Sampled by : CUSTOMER (c)
2.3 Number of Samples : 01
2.4 Date of Receipt : 2024-04-19
2.5 Test Period : 2024-04-19 to 2024-04-25
2.6 Date of Issue : 2024-04-25
2.7 Sampling Date and Time : Not Specified
2.8 Quotation No. : COT-115830-SL24

3. TEST REQUESTED - METHODOLOGY USED

ESSAY	METHOD
<u>Residual Hexane Analysis</u>	Gas Chromatography

4. RESULTS

4.1. Sample Description: GP ORO 20 NATURAL / (b) (4) DRY NATURAL/NATURAVE 20
Composite lot: 08/G-4222; 08/F-4221; 08/E-4221. (c)

(b) (6)

(b) (4), (b) (6)

(b) (4)

TEST REPORT IE-2024-0771

4.2. RESULTS OBTAINED FROM RESIDUAL HEXANE

Table N°1: RESULTS OBTAINED

S-1607	Residual Hexane	mg/kg	0.50	<0.50

Legend

LCM: Limit of Quantification Method.

^(c) Information provided by the customer.

- Without the approval of the laboratory (b) (4), the partial test report should not be reproduced, except when reproduced in its entirety.
- Test results apply to the sample as received and should not be used as a statement of conformance to a specification or product standards of the producing entity.
- The laboratory is not responsible for information that has been identified as having been supplied by the customer.
- Sampling is outside the scope of accreditation.
- The results relate only to the items tested.
- This laboratory is accredited according to the recognized international standard ISO/IEC 17025. This accreditation demonstrates technical competence for a defined scope and operation of a laboratory quality management system.

END OF DOCUMENT

(b) (4), (b) (6)

(b) (4)

(b) (4), (b) (6)

(b) (4), (b) (6)

(b) (4), (b) (6)

Person in charge: (b) (6)

(b) (6) 04.08.2022

Analytical report

AR-22-XP-027671-01

(b) (4)

Sample Code

(b) (4)

Reception date time:

25.07.2022

Sample name:

Marigold Powder

Marking:

"PRODUCTO: GP ORO 20 NATURAL
LOTE COMPOSITO: 09/LMNO-3651
peso: 100g"

Client sample code:

2022PO2695-3

Origin:

(b) (6)

Organic:

No

Original client:

(b) (4).

Sampling date:

27.07.2022

Amount:

500 g

Start analysis:

28.07.2022

End analysis:

04.08.2022

Dioxins	Result	Unit
---------	--------	------

GFL11 polychlorinated biphenyls (12 WHO PCB + 6 ICES PCB)

Method: Internal, GLS DF 110:2022-06-30, GC-MS/MS

(Modification: GLS DF 110:2019-01-25)

Subcontracted to (b) (4), which is accredited for this test.

PCB 77	(b) (4)	pg/g
PCB 81		pg/g
PCB 105		pg/g
PCB 114		pg/g
PCB 118		pg/g
PCB 123		pg/g
PCB 126		pg/g
PCB 156		pg/g

Page 1/3

All information regarding the sample (except those recorded on site or at sample registration by (b) (4) have been provided by the client. This information can have an impact on the validity of the analytical results and the result assessment.

The results of examination refer exclusively to the checked samples.
Any publication of this report requires written permission. An excerpt publication is not allowed.

(b) (4), (b) (6)

(b) (4)

Analytical report: AR-22-XP-027671-01
Sample Code: (b) (4)

Dioxins	Result	Unit
PCB 157	(b) (4)	pg/g
PCB 167		pg/g
PCB 169		pg/g
PCB 189		pg/g
WHO(2005)-PCB TEQ (lower-bound)		pg/g
WHO(2005)-PCB TEQ (medium-bound)		pg/g
WHO(2005)-PCB TEQ (upper-bound)		pg/g
PCB 28		ng/g
PCB 52		ng/g
PCB 101		ng/g
PCB 138		ng/g
PCB 153		ng/g
PCB 180		ng/g
Total 6 ndl-PCB (medium-bound)		ng/g
Total 6 ndl-PCB (lower-bound)		ng/g
Total 6 ndl-PCB (upper-bound)		ng/g

GFL05 Dioxins and Furans (17 PCDD/F)

Method: Internal, GLS DF 110:2022-06-30, GC-MS/MS
(Modification: GLS DF 110:2019-01-25)

Subcontracted to (b) (4), which is accredited for this test.

2,3,7,8-TetraCDD	(b) (4)	pg/g
1,2,3,7,8-PentaCDD		pg/g
1,2,3,4,7,8-HexaCDD		pg/g
1,2,3,6,7,8-HexaCDD		pg/g
1,2,3,7,8,9-HexaCDD		pg/g
1,2,3,4,6,7,8-HeptaCDD		pg/g
OctaCDD		pg/g
2,3,7,8-TetraCDF		pg/g
1,2,3,7,8-PentaCDF		pg/g
2,3,4,7,8-PentaCDF		pg/g
1,2,3,4,7,8-HexaCDF		pg/g
1,2,3,6,7,8-HexaCDF		pg/g
1,2,3,7,8,9-HexaCDF		pg/g
2,3,4,6,7,8-HexaCDF		pg/g
1,2,3,4,6,7,8-HeptaCDF		pg/g
1,2,3,4,7,8,9-HeptaCDF		pg/g
OctaCDF		pg/g
WHO(2005)-PCDD/F TEQ (lower-bound)	pg/g	
WHO(2005)-PCDD/F TEQ (medium-bound)	pg/g	
WHO(2005)-PCDD/F TEQ (upper-bound)	pg/g	

Page 2/3

All information regarding the sample (except those recorded on site or at sample registration by (b) (4)) have been provided by the client. This information can have an impact on the validity of the analytical results and the result assessment.

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Any publication of this report requires written permission. An excerpt publication is not allowed.

(b) (4), (b) (6)

(b) (4)

Analytical report: AR-22-XP-027671-01
Sample Code: (b) (4)

Dioxins	Result	Unit
GFTE1 TEQ-Totals WHO-PCDD/F and PCB		
Method: Internal, DF:110-3/120-3/130-3/140-4, Calculation (Modification: GLS DF 110, 120, 130, 140)		
Subcontracted to (b) (4), which is accredited for this test.		
WHO(2005)-PCDD/F+PCB TEQ (lower-bound)	(b) (4)	pg/g
WHO(2005)-PCDD/F+PCB TEQ (medium-bound)		pg/g
WHO(2005)-PCDD/F+PCB TEQ (upper-bound)		pg/g

MRL = Maximum Residue Level

RL = Reporting Limit

(b) (4)
Analytical Service Manager (b) (6)

Page 3/3

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(b) (4), (b) (6)

PRODUCTO: GP ORO 20 NATURAL

LOTE COMPOSITO:09/LMNO-3651

peso :100g

28.07.2022 13:13

OuG

00 029 437

(b) (4)

3M

(b) (4)

N/A

Extrakt, Pflanze

04.08.2022 12:00

(b) (4)

Proben Nummer: <

(b) (4)

(b) (4)

(b) (4), (b) (6)

(b) (4), (b) (6)

Person in charge: (b) (6)

(b) (4), (b) (6)

(b) (6) 28.08.2023

Analytical report

AR-23-XP-031080-01

(b) (4)

Sample Code

(b) (4)

Reception date time:

23.08.2023

Sample name:

Marigold Powder

Marking:

NOMBRE DEL PRODUCTO: GP ORO 20 NATURAL LOTE

COMPOSITO:

18/GHI-3938 CANTIDAD (g): 100

Client sample code:

#2023PO000299 -4

Client purchase order reference

#2023PO000299

Origin:

(b) (6)

Organic:

No

Original client:

(b) (4)

Sampling date:

14.08.2023

Amount:

100 g

Start analysis:

23.08.2023

End analysis:

28.08.2023

Dioxins	Result	Unit
---------	--------	------

GFL11 polychlorinated biphenyls (12 WHO PCB + 6 ICES PCB)

Method: Internal, GLS DF 110:2023-05-31, GC-MS/MS

(Modification: GLS DF 110:2019-01-25)

Subcontracted to (b) (4), which is accredited for this test.

PCB 77	(b) (4)	pg/g
PCB 81		pg/g
PCB 105		pg/g
PCB 114		pg/g
PCB 118		pg/g
PCB 123		pg/g
PCB 126		pg/g

Page 1/3

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(b) (4), (b) (6)

(b) (4)

Dioxins	Result	Unit
PCB 156	(b) (4)	pg/g
PCB 157		pg/g
PCB 167		pg/g
PCB 169		pg/g
PCB 189		pg/g
WHO(2005)-PCB TEQ (lower-bound)		pg/g
WHO(2005)-PCB TEQ (medium-bound)		pg/g
WHO(2005)-PCB TEQ (upper-bound)		pg/g
PCB 28		ng/g
PCB 52		ng/g
PCB 101		ng/g
PCB 138		ng/g
PCB 153		ng/g
PCB 180		ng/g
Total 6 ndl-PCB (medium-bound)		ng/g
Total 6 ndl-PCB (lower-bound)		ng/g
Total 6 ndl-PCB (upper-bound)		ng/g

GFL05 Dioxins and Furans (17 PCDD/F)

Method: Internal, GLS DF 110:2023-05-31, GC-MS/MS

(Modification: GLS DF 110:2019-01-25)

Subcontracted to (b) (4), which is accredited for this test.

2,3,7,8-TetraCDD	(b) (4)	pg/g
1,2,3,7,8-PentaCDD		pg/g
1,2,3,4,7,8-HexaCDD		pg/g
1,2,3,6,7,8-HexaCDD		pg/g
1,2,3,7,8,9-HexaCDD		pg/g
1,2,3,4,6,7,8-HeptaCDD		pg/g
OctaCDD		pg/g
2,3,7,8-TetraCDF		pg/g
1,2,3,7,8-PentaCDF		pg/g
2,3,4,7,8-PentaCDF		pg/g
1,2,3,4,7,8-HexaCDF		pg/g
1,2,3,6,7,8-HexaCDF		pg/g
1,2,3,7,8,9-HexaCDF		pg/g
2,3,4,6,7,8-HexaCDF		pg/g
1,2,3,4,6,7,8-HeptaCDF		pg/g
1,2,3,4,7,8,9-HeptaCDF		pg/g
OctaCDF		pg/g
WHO(2005)-PCDD/F TEQ (lower-bound)	pg/g	
WHO(2005)-PCDD/F TEQ (medium-bound)	pg/g	
WHO(2005)-PCDD/F TEQ (upper-bound)	pg/g	

All information regarding the sample (except those recorded on site or at sample registration by (b) (4) have been provided by the client. This information can have an impact on the validity of the analytical results and the result assessment.

The results of examination refer exclusively to the checked samples.
Any publication of this report requires written permission. An excerpt publication is not allowed.

(b) (4), (b) (6)

(b) (4)

Analytical report: AR-23-XP-031080-01
Sample Code: (b) (4)

Dioxins	Result	Unit
---------	--------	------

GFTE1 TEQ-Totals WHO-PCDD/F and PCB

Method: Internal, DF:110-5/120-5/130-3/140-5, Calculation

(Modification: GLS DF 110, 120, 130, 140)

Subcontracted to (b) (4) which is accredited for this test.

WHO(2005)-PCDD/F+PCB TEQ (lower-bound)

(b) (4)

pg/g

WHO(2005)-PCDD/F+PCB TEQ (medium-bound)

pg/g

WHO(2005)-PCDD/F+PCB TEQ (upper-bound)

pg/g

MRL = Maximum Residue Level

RL = Reporting Limit

(b) (4), (b) (6)

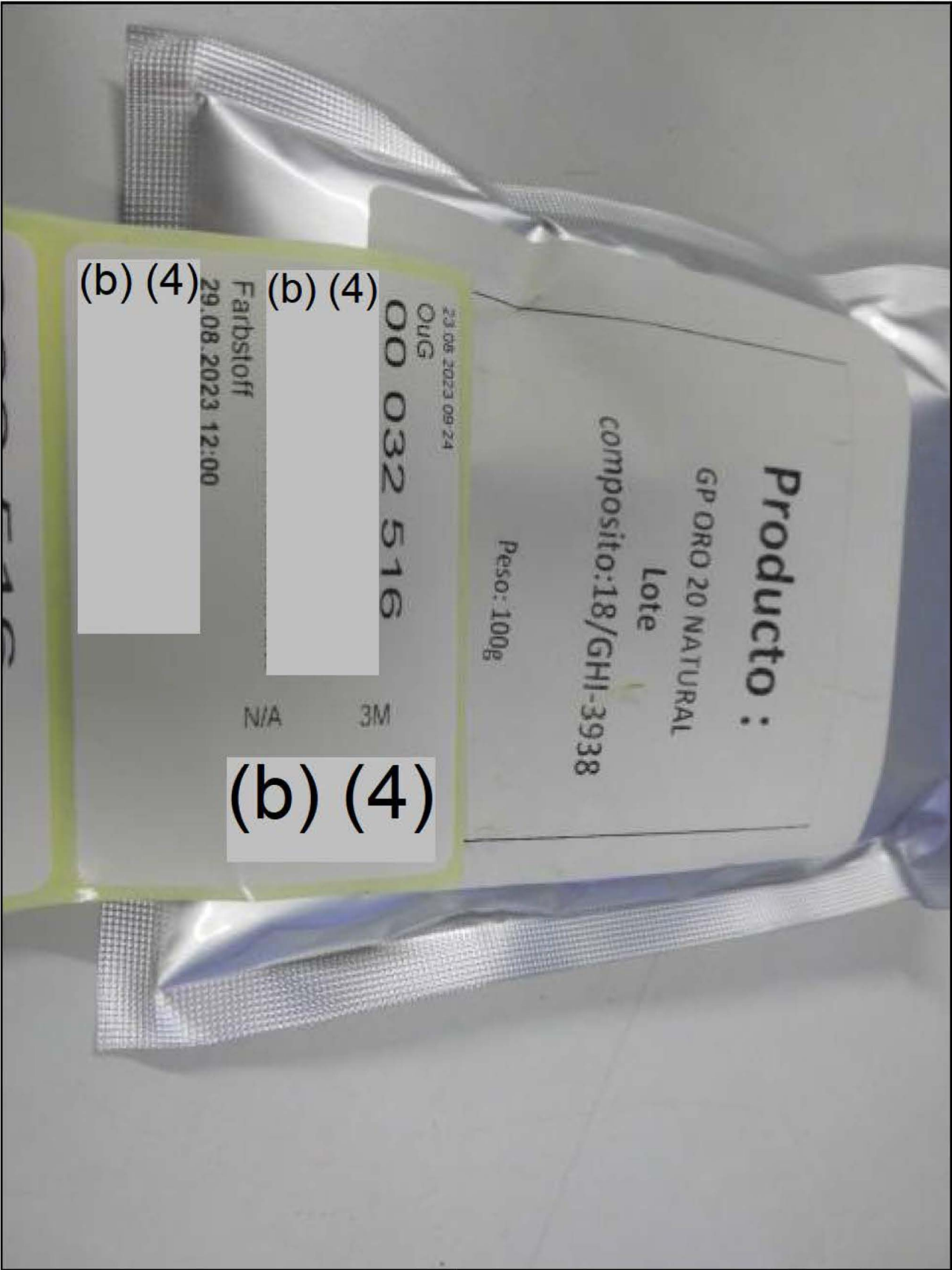
Analytical Service Manager (b) (6)

Page 3/3

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(b) (4), (b) (6)



Proben Nummer: <

(b) (4)

(b) (4)

(b) (4)

(b) (4)

Person in charge: (b) (6)

(b) (4), (b) (6)

(b) (6) 28.08.2023

Analytical report

AR-23-XP-031082-01

(b) (4)

Sample Code

(b) (4)

Reception date time:

23.08.2023

Sample name:

Marigold Powder

Marking:

NOMBRE DEL PRODUCTO: (b) (4) DRY

LOTE

COMPOSITO: 20/PO-3958 CANTIDAD (g): 100

Client sample code:

#2023PO000299 -6

Client purchase order reference

#2023PO000299

Origin:

(b) (6)

Organic:

No

Original client:

(b) (4)

Sampling date:

14.08.2023

Amount:

100 g

Start analysis:

23.08.2023

End analysis:

28.08.2023

Dioxins	Result	Unit
---------	--------	------

GFL11 polychlorinated biphenyls (12 WHO PCB + 6 ICES PCB)

Method: Internal, GLS DF 110:2023-05-31, GC-MS/MS

(Modification: GLS DF 110:2019-01-25)

Subcontracted to (b) (4), which is accredited for this test.

PCB 77	< 2.51	pg/g
PCB 81	< 0.377	pg/g
PCB 105	< 5.45	pg/g
PCB 114	< 0.740	pg/g
PCB 118	< 19.6	pg/g
PCB 123	< 0.559	pg/g
PCB 126	< 0.349	pg/g

Page 1/3

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(b) (4), (b) (6)

(b) (4)

Analytical report: AR-23-XP-031082-01
Sample Code: (b) (4)

Dioxins	Result	Unit
PCB 156	(b) (4)	pg/g
PCB 157		pg/g
PCB 167		pg/g
PCB 169		pg/g
PCB 189		pg/g
WHO(2005)-PCB TEQ (lower-bound)		pg/g
WHO(2005)-PCB TEQ (medium-bound)		pg/g
WHO(2005)-PCB TEQ (upper-bound)		pg/g
PCB 28		ng/g
PCB 52		ng/g
PCB 101		ng/g
PCB 138		ng/g
PCB 153		ng/g
PCB 180		ng/g
Total 6 ndl-PCB (medium-bound)		ng/g
Total 6 ndl-PCB (lower-bound)		ng/g
Total 6 ndl-PCB (upper-bound)		ng/g

GFL05 Dioxins and Furans (17 PCDD/F)

Method: Internal, GLS DF 110:2023-05-31, GC-MS/MS
(Modification: GLS DF 110:2019-01-25)

Subcontracted to (b) (4), which is accredited for this test.

2,3,7,8-TetraCDD	(b) (4)	pg/g
1,2,3,7,8-PentaCDD		pg/g
1,2,3,4,7,8-HexaCDD		pg/g
1,2,3,6,7,8-HexaCDD		pg/g
1,2,3,7,8,9-HexaCDD		pg/g
1,2,3,4,6,7,8-HeptaCDD		pg/g
OctaCDD		pg/g
2,3,7,8-TetraCDF		pg/g
1,2,3,7,8-PentaCDF		pg/g
2,3,4,7,8-PentaCDF		pg/g
1,2,3,4,7,8-HexaCDF		pg/g
1,2,3,6,7,8-HexaCDF		pg/g
1,2,3,7,8,9-HexaCDF		pg/g
2,3,4,6,7,8-HexaCDF		pg/g
1,2,3,4,6,7,8-HeptaCDF		pg/g
1,2,3,4,7,8,9-HeptaCDF		pg/g
OctaCDF		pg/g
WHO(2005)-PCDD/F TEQ (lower-bound)	pg/g	
WHO(2005)-PCDD/F TEQ (medium-bound)	pg/g	
WHO(2005)-PCDD/F TEQ (upper-bound)	pg/g	

Page 2/3

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(b) (4), (b) (6)

(b) (4)

Analytical report: AR-23-XP-031082-01
Sample Code: (b) (4)

Dioxins	Result	Unit
---------	--------	------

GFTE1 TEQ-Totals WHO-PCDD/F and PCB

Method: Internal, DF:110-5/120-5/130-3/140-5, Calculation

(Modification: GLS DF 110, 120, 130, 140)

Subcontracted to (b) (4), which is accredited for this test.

WHO(2005)-PCDD/F+PCB TEQ (lower-bound)	(b) (4)	pg/g
WHO(2005)-PCDD/F+PCB TEQ (medium-bound)		pg/g
WHO(2005)-PCDD/F+PCB TEQ (upper-bound)		pg/g

MRL = Maximum Residue Level

RL = Reporting Limit

(b) (6)

Analytical Service Manager (b) (6)

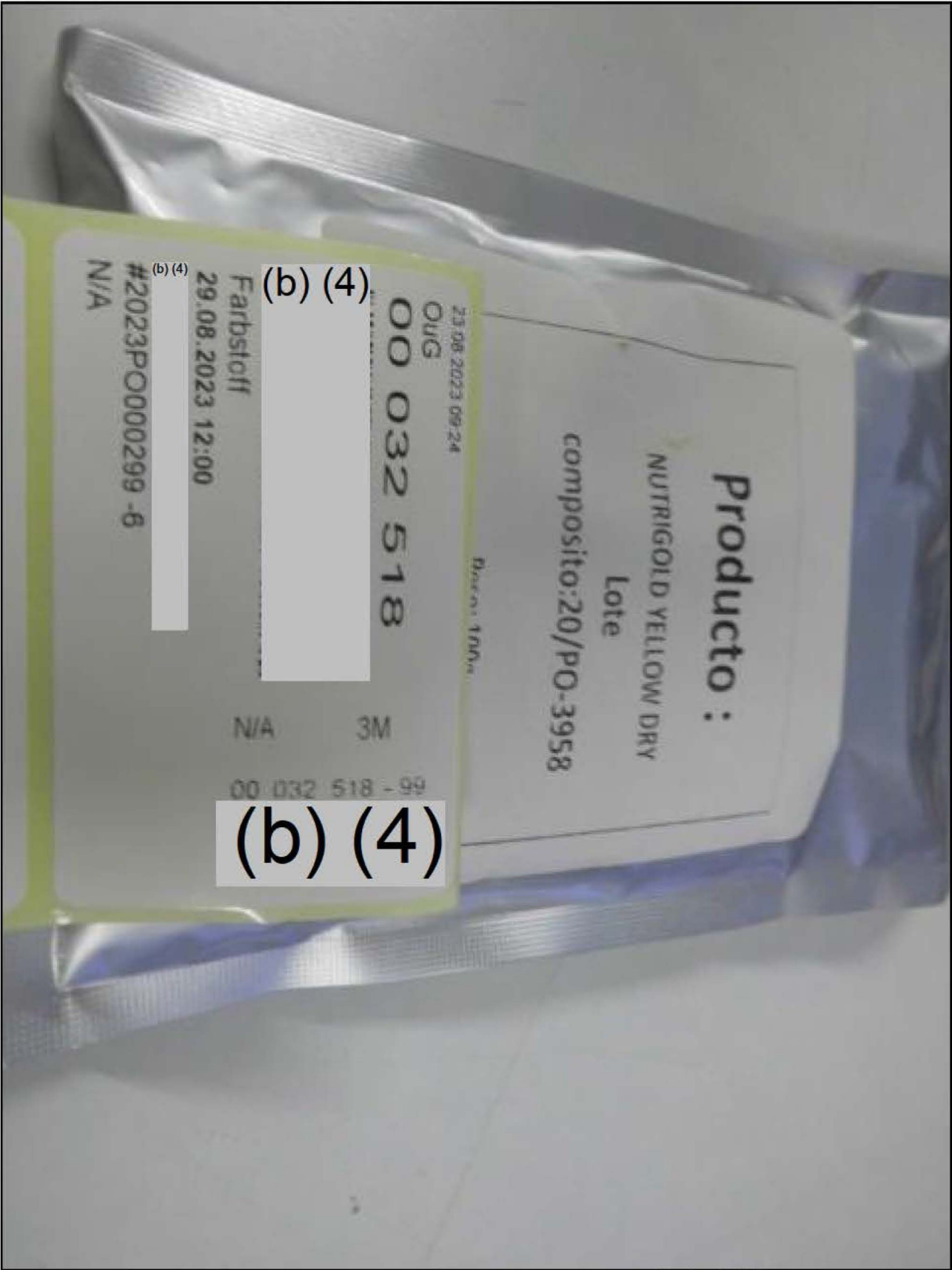
Page 3/3

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(b) (4), (b) (6)

Our General Terms & Conditions, available upon request and online at (b) (6), shall apply.



(b) (4)
#2023PO000299 -6
N/A

(b) (4)
Farbstoff
29.08.2023 12:00

23.08.2023 09:24
OUG
00 032 518

Disc: 1100

Producto :
NUTRIGOLD YELLOW DRY
Lote
composito: 20/PO-3958

N/A 3M

00 032 518 - 99

(b) (4)

Proben Nummer:

(b) (4)

(b) (4)

Methods

Counting of Mesophilic Aerobic Microorganisms: UNE-EN ISO 4833-1:2014 /A1:2022 Microbiology of the food chain. Horizontal method for counting microorganisms. Part. 1: Colony count at 30°C by deep seeding technique. Amendment 1: Clarification of the purpose and scope (ISO 4833-1:2013/Amd 1:2022).

Staphylococcus aureus (Count): FDA Bacteriological Analytical On line. Hypertext.source. Chapter 12. 8th Ed. Revision A, 1998. January 2001 (Rev. March. 2016). 2016 Staphylococcus aureus. Direct Plate Count Method.

Sampling is not part of the scope of accreditation of the (b) (4) testing laboratory.

(b) (6)

----- End of document -----

(b) (6)

(b) (4)

Methods

Molds Count: ICMSF Microorganisms in Food. Their significance and methods of enumeration. P. 165-167 2nd Ed. Reprint 2000 1983 M o l d and yeast counts. Method of enumeration of molds and yeasts by plate seeding on the whole medium.

Mesophilic Aerobic Microorganism Count: UNE-EN ISO 4833-1:2014 /A1:2022. 2022. Microbiology of the food chain. Horizontal method for counting microorganisms. Part. 1: Colony count at 30°C by depth seeding technique. Amendment 1: Clarification of the purpose and scope (ISO 4833-1:2013/Amd 1:2022).

Staphylococcus Aureus Count: ISO 6888-1:2021. Except item 9.4.3; Annex B.5 2021 Microbiology of the Food Chain -- Horizontal Method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) – Part 1: Method using Baird-Parker agar medium

Sampling is not part of the scope of accreditation of the (b) (4) testing laboratory.

(b) (6)

End of document

(b) (4)

Methods

Molds Count: ICMSF Microorganisms in Food. Their significance and methods of enumeration. P. 165-167 2nd Ed. Reprint 2000 1983 M o l d and yeast counts. Method of enumeration of molds and yeasts by plate seeding on the whole medium.

Mesophilic Aerobic Microorganism Count: UNE-EN ISO 4833-1:2014 /A1:2022. 2022. Microbiology of the food chain. Horizontal method for counting microorganisms. Part. 1: Colony count at 30°C by depth seeding technique. Amendment 1: Clarification of the purpose and scope (ISO 4833-1:2013/Amd 1:2022).

Staphylococcus Aureus Count: ISO 6888-1:2021. Except item 9.4.3; Annex B.5 2021 Microbiology of the Food Chain -- Horizontal Method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species) – Part 1: Method using Baird-Parker agar medium

Sampling is not part of the scope of accreditation of the (b) (4) testing laboratory.

(b) (6)

————— End of document —————

(b) (4)

(b) (4), (b) (6)

REVIEW OF STABILITY STUDIES FOR (b) DRY AND THE ACTIVE INGREDIENT, MARIGOLD EXTRACT

Study 1

Two commercial lots of (b) Dry in from commercial production and packaging were stored at ambient temperature. Xanthophyll content was analyzed from three aliquots of each lot at time zero and 6 months and found to still be above the release criteria of 45 g/kg xanthophyll at 6 months.

Xanthophyll Content (g / kg)	
	Lot# (b) (4)
Initial Level, May 2004*	(b) (4)
Aliquot #1, 6 months	(b) (4)
Aliquot #2, 6 months	(b) (4)
Aliquot #3, 6 months	(b) (4)
Average Xanthophylls @ 6 mos	(b) (4)
Release Criteria	(b) (4)

Study 2

As part of a larger packaging study, (b) Dry commercially produced lot (b) (4) was packaged on the production line, then brought to the lab and (b) (4)

(b) (4) A 200 gram composite sample was pulled during repackaging and analyzed in triplicate for total xanthophylls to act as a new mean time zero value. The triplicate analysis of this (b) (4) lot at the beginning of the study resulted in a mean 48.75 g/kg total xanthophylls, with a standard deviation of 0.42 and standard error percent of 0.86%.

(b) (4)

Three replicates for each timepoint were also prepared for the Mylar and atmospheric headspace analysis. There was no statistical change in xanthophyll content over the six months of this study. Oxidation reactions in the stored product are expected and likely proceeded rapidly at (b) (4) as long as oxygen was available. Using a rule of Q-10 where chemical reactions occur twice as fast for each (b) (4) increase in temperature, six months at (b) (4) is equivalent to 12 months at (b) (4) (ambient storage temp of many customer facilities throughout the seasons and locations).

Total Xanthophylls (g/kg)						
Release at production	Beginning of study	2 weeks	1 month	2 months	4 months	6 months
49.67 g/kg	48.75	(b) (4)	(b) (4)	(b) (4)	(b) (4)	(b) (4)

(b) (4)



Study 3

Commercially produced and packaged bags of [REDACTED]^(b) Dry were selected from the warehouse and moved to laboratory space where they continued to be stored at ambient temperatures until sampling, for up to 12 months. Individual bags from each lot were sampled then discarded, so each analysis is from a different bag within the lot. All lots maintained activity above the release criteria for 12 months.

Total Xanthophylls (g/kg)					
Lot number	Release Criteria	Time 0	4 months	7 months	12 months
Lot (b) (4)	45.0	47.52	(b) (4)		
Lot	45.0	49.38			
Lot	45.0	45.02			
Lot	45.0	46.22			

Study 4

Marigold oleoresin was obtained from three lots of commercial production of this active ingredient of [REDACTED]^(b) Dry. Analysis was carried out on all three lots every four months for a period of three years. For the entirety of analysis, xanthophyll activity did not vary more than 2% from time zero.

(b) (4)	STABILITY REPORT	Code	F-PI-PE-ID-P-003-003
		Version	01
Title: LONG-TERM STABILITY STUDY FOR (b) (4) NATURAL		Page	1 of 4
		Issue Date	August 2018

1. PRODUCT INFORMATION

- Product : (b) (4) NATURAL
- Presentation : Powder
- Lots : 23/A-2017, 23/B-2018, 23/C-2019
- Active ingredient : Marigold Xanthophylls
- Packaging : Platinum bags sealed with vacuum nitrogen

2. STUDY INFORMATION

2.1. STUDY DATA

Lot	(b) (4)		
Manufacture date	14/06/2018	14/06/2018	14/06/2018
Stability start date	14/06/2018	14/06/2018	14/06/2018
Stability end date	14/12/2019	14/12/2019	14/12/2019
Lot size	2200.00	2200	2200
Sample size	0.1 kg	0.1 kg	0.1 kg

2.2. STORAGE CONDITIONS

- Temperature : 28 ± 2°C
- Humidity : 65% RH ± 5 % RH
- Analysis times : 0, 6, 12 and 18 months

2.3. EQUIPMENT USED

- Analytical balance (b) (4).
- Spectrophotometer UV/VIS (b) (4).
- Ultrasonic bath (b) (4).
- (b) (4).

2.4. TEST PARAMETERS

TESTS	PARAMETERS
Total Xanthophylls	20.00 – 20.50 g/kg.

(b) (4)	STABILITY REPORT	Code	F-PI-PE-ID-P-003-003
		Version	01
Title: Title: LONG-TERM STABILITY STUDY FOR (b) (4) NATURAL		Page	2 of 4
		Issue Date	August 2018

2.5. METHODS

Determination of Xanthophylls in Marigold Saponified Products TA-GE-PI-002-V02. Referred to Official Method of Analysis "Carotenes and xanthophylls in dried plant materials and mixed feeds" AOAC 970.64 Ch.45 p.10 Ed.20th, 2016.

3. RESULTS

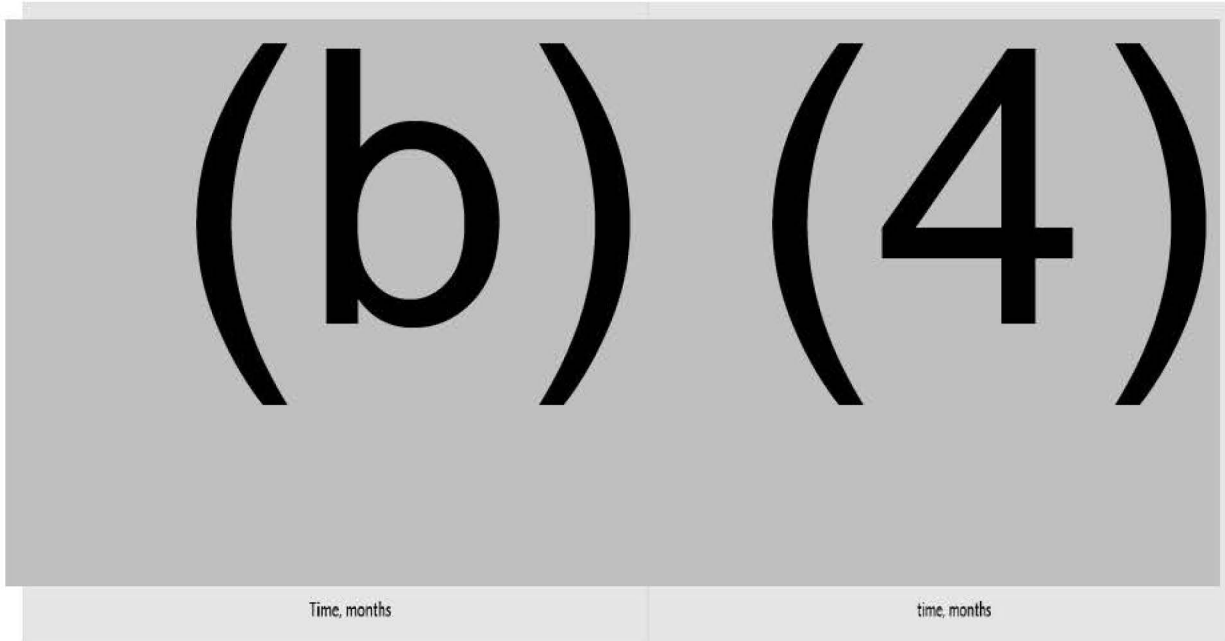
Table N°1 details the results Xanthophylls concentration (g/Kg) analyzed at different time intervals: 0, 6, 12 and 18 months, in three lots of pigment: (b) (4).

Table N°1. Xanthophyll and Lutein concentration.

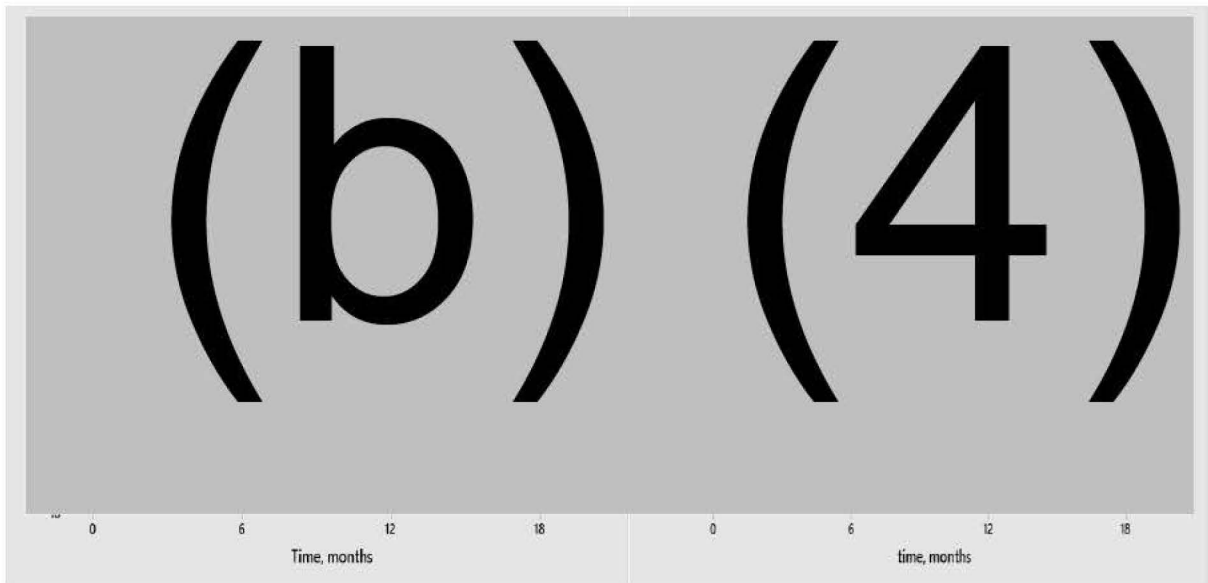
LOTS	Time (months)	Xanthophylls (g/Kg)	Degradation (%)
(b) (4)	0	21.09	0.00
	6	(b) (4)	(b) (4)
	12		
	18		
0			
(b) (4)	6	(b) (4)	(b) (4)
	12		
	18		
	0		
(b) (4)	6	(b) (4)	(b) (4)
	12		
	18		
	0		

(b) (4)	STABILITY REPORT	Code	F-PI-PE-ID-P-003-003
		Version	01
Title: Title: LONG-TERM STABILITY STUDY FOR (b) (4) NATURAL		Page	3 of 4
		Issue Date	August 2018

Xanthophylls degradation from lot (b) (4).

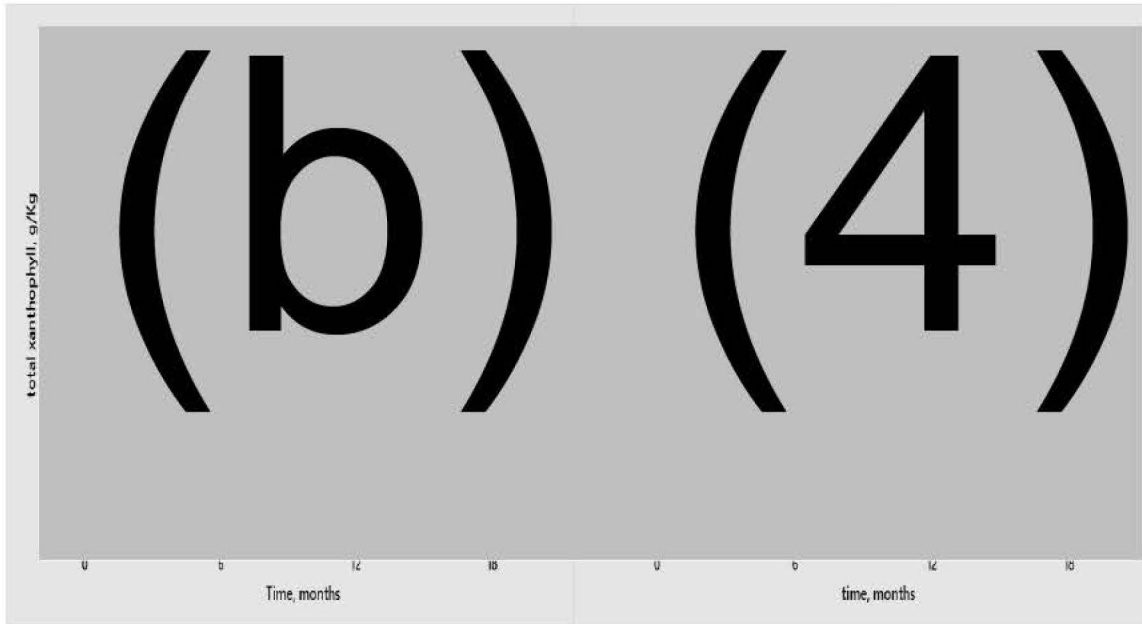


Xanthophylls degradation from lot (b) (4).



(b) (4)	STABILITY REPORT	Code	F-PI-PE-ID-P-003-003
		Version	01
Title: Title: LONG-TERM STABILITY STUDY FOR (b) (4) (b) (4) NATURAL		Page	4 of 4
		Issue Date	August 2018

Xanthophylls degradation from lot (b) (4).



4. CONCLUSIONS

In order to determine the validity period of the (b) (4) NATURAL product, a long-term stability study was designed for 18 months, performing an evaluation every 6 months. According to the stability study, the (b) (4) NATURAL product presents a stability of total xanthophylls concentration for 18 months under normal conditions in original packaging.

(b) (4) recommends a minimum shelf life of 18 months from the date manufacture.

(b) (6)

Royal Canin USA

Person(s) Requesting Services:

(b) (6)
5/8/2024
(b) (6)

Report Generated On - Date:

Authorizing Personnel:

Purchase Order #:

Xanthophylls

Product 5511 Royal Canin Feline Mother and Babycat 12oz bag dry

ELIMS #	ECTI# (Can#)	Product	Sample	ECTI Group#	Time (t)	Date Tested	trans-Lutein mcg/g	cis-Lutein mcg/g	Total Lutein mcg/g	trans-Zeaxanthin mcg/g	cis-Zeaxanthin mcg/g	Total Zeaxanthin mcg/g
129-2019-03120001	1	RFMB	A	1	0	13-Mar-19	(b) (4)	(b) (4)	12.216	(b) (4)	(b) (4)	2.390
129-2019-03120001	1	RFMB	B	1	0	13-Mar-19	(b) (4)	(b) (4)	12.366	(b) (4)	(b) (4)	2.635
129-2019-04110001	2	RFMB	A	1	1	12-Apr-19	(b) (4)	(b) (4)	12.363	(b) (4)	(b) (4)	1.936
129-2019-04110001	2	RFMB	B	1	1	12-Apr-19	(b) (4)	(b) (4)	12.575	(b) (4)	(b) (4)	2.366
2019-0190	3	RFMB	A	1	3	14-Jun-19	(b) (4)	(b) (4)	10.306	(b) (4)	(b) (4)	1.898
2019-0190	3	RFMB	B	1	3	14-Jun-19	(b) (4)	(b) (4)	10.414	(b) (4)	(b) (4)	1.987
129-2019-09160002	4	RFMB	A	1	6	16-Sep-19	(b) (4)	(b) (4)	12.665	(b) (4)	(b) (4)	2.368
129-2019-09160002	4	RFMB	B	1	6	16-Sep-19	(b) (4)	(b) (4)	12.876	(b) (4)	(b) (4)	2.445
129-2019-12120008	5	RFMB	A	1	9	12-Dec-19	(b) (4)	(b) (4)	11.488	(b) (4)	(b) (4)	2.342
129-2019-12120008	5	RFMB	B	1	9	12-Dec-19	(b) (4)	(b) (4)	12.184	(b) (4)	(b) (4)	2.547
129-2020-03120002	6	RFMB	A	1	12	12-Mar-20	(b) (4)	(b) (4)	13.189	(b) (4)	(b) (4)	2.676
129-2020-03120002	6	RFMB	B	1	12	12-Mar-20	(b) (4)	(b) (4)	13.681	(b) (4)	(b) (4)	2.761
129-2020-06110002	7	RFMB	A	1	15	11-Jun-20	(b) (4)	(b) (4)	13.014	(b) (4)	(b) (4)	2.656
129-2020-06110002	7	RFMB	B	1	15	11-Jun-20	(b) (4)	(b) (4)	14.427	(b) (4)	(b) (4)	2.877
129-2020-09140005	8	RFMB	A	1	18	16-Sep-20	(b) (4)	(b) (4)	13.609	(b) (4)	(b) (4)	2.666
129-2020-09140005	8	RFMB	B	1	18	16-Sep-20	(b) (4)	(b) (4)	13.226	(b) (4)	(b) (4)	2.622
129-2021-03080010	9	RFMB	A	1	24	8-Mar-21	(b) (4)	(b) (4)	12.991	(b) (4)	(b) (4)	2.619
129-2021-03080010	9	RFMB	B	1	24	8-Mar-21	(b) (4)	(b) (4)	13.338	(b) (4)	(b) (4)	2.742

129-2019-07220010	1	RFMB	A	2	0	22-Jul-19	(b) (4)	11.125	(b) (4)	1.700
129-2019-07220010	1	RFMB	B	2	0	22-Jul-19	(b) (4)	10.740	(b) (4)	1.672
129-2019-08210005	2	RFMB	A	2	1	21-Aug-19	(b) (4)	10.838	(b) (4)	1.708
129-2019-08210005	2	RFMB	B	2	1	21-Aug-19	(b) (4)	10.845	(b) (4)	1.601
129-2019-10230005	3	RFMB	A	2	3	23-Oct-19	(b) (4)	11.134	(b) (4)	1.684
129-2019-10230005	3	RFMB	B	2	3	23-Oct-19	(b) (4)	11.071	(b) (4)	1.686
129-2020-01220019	4	RFMB	A	2	6	22-Jan-20	(b) (4)	11.750	(b) (4)	1.715
129-2020-01220019	4	RFMB	B	2	6	22-Jan-20	(b) (4)	11.688	(b) (4)	1.725
129-2020-04200001	5	RFMB	A	2	9	20-Apr-20	(b) (4)	12.464	(b) (4)	2.172
129-2020-04200001	5	RFMB	B	2	9	20-Apr-20	(b) (4)	12.160	(b) (4)	2.139
129-2020-07220001	6	RFMB	A	2	12	28-Jul-20	(b) (4)	11.427	(b) (4)	2.017
129-2020-07220001	6	RFMB	B	2	12	28-Jul-20	(b) (4)	11.312	(b) (4)	1.813
129-2020-10260001	7	RFMB	A	2	15	26-Oct-20	(b) (4)	11.704	(b) (4)	1.632
129-2020-10260001	7	RFMB	B	2	15	26-Oct-20	(b) (4)	12.496	(b) (4)	1.690
129-2021-01280001	8	RFMB	A	2	18	28-Jan-21	(b) (4)	10.388	(b) (4)	1.668
129-2021-01280001	8	RFMB	B	2	18	28-Jan-21	(b) (4)	11.329	(b) (4)	1.829
129-2021-07210039	9	RFMB	A	2	24	21-Jul-21	(b) (4)	12.062	(b) (4)	1.843
129-2021-07210039	9	RFMB	B	2	24	21-Jul-21	(b) (4)	11.447	(b) (4)	1.752
129-2020-03180015	1	RFMB	A	3	0	18-Mar-20	(b) (4)	10.778	(b) (4)	2.209
129-2020-03180015	1	RFMB	B	3	0	18-Mar-20	(b) (4)	10.195	(b) (4)	2.042
129-2020-04300003	2	RFMB	A	3	1	30-Apr-20	(b) (4)	12.270	(b) (4)	2.566
129-2020-04300003	2	RFMB	B	3	1	30-Apr-20	(b) (4)	11.626	(b) (4)	2.415
129-2020-06230003	3	RFMB	A	3	3	25-Jun-20	(b) (4)	11.969	(b) (4)	2.372
129-2020-06230003	3	RFMB	B	3	3	25-Jun-20	(b) (4)	12.035	(b) (4)	2.325
129-2020-09170002	4	RFMB	A	3	6	21-Sep-20	(b) (4)	11.974	(b) (4)	2.357
129-2020-09170002	4	RFMB	B	3	6	21-Sep-20	(b) (4)	12.031	(b) (4)	2.305
129-2020-12170001	5	RFMB	A	3	9	17-Dec-20	(b) (4)	11.345	(b) (4)	2.424
129-2020-12170001	5	RFMB	B	3	9	17-Dec-20	(b) (4)	13.433	(b) (4)	1.503
129-2021-03150004	6	RFMB	A	3	12	15-Mar-21	(b) (4)	11.570	(b) (4)	2.544

129-2021-03150004	6	RFMB	B	3	12	15-Mar-21	(b) (4)	11.001	(b) (4)	2.309
129-2021-06150002	7	RFMB	A	3	15	15-Jun-21	(b) (4)	13.055	(b) (4)	2.362
129-2021-06150002	7	RFMB	B	3	15	15-Jun-21	(b) (4)	11.405	(b) (4)	2.171
129-2021-09140003	8	RFMB	A	3	18	14-Sep-21	(b) (4)	10.537	(b) (4)	2.168
129-2021-09140003	8	RFMB	B	3	18	14-Sep-21	(b) (4)	10.836	(b) (4)	2.203
	9	RFMB	A	3	24		(b) (4)	0.000	(b) (4)	0.000
	9	RFMB	B	3	24		(b) (4)	0.000	(b) (4)	0.000

Royal Canin USA

Person(s) Requesting Services:

(b) (6)
5/8/2024
(b) (6)

Report Generated On - Date:

Authorizing Personnel:

Purchase Order #:

Xanthophylls

Product 7715 VDC HYPOALL

ELIMS #	ECT# (Can#)	Product	Sample	ECTI Group#	Time (t)	Date Tested	trans-Lutein mcg/g	cis-Lutein mcg/g	Total Lutein mcg/g	trans-Zeaxanthin mcg/g	cis-Zeaxanthin mcg/g	Total Zeaxanthin mcg/g
129-2019-0213003	1	RCHY	A	1	0	2/13/19	(b) (4)		3.395	(b) (4)		0.415
129-2019-0213003	1	RCHY	B	1	0	2/13/19	(b) (4)		3.085	(b) (4)		0.389
129-2019-03130002	2	RCHY	A	1	1	3/14/19	(b) (4)		3.489	(b) (4)		0.467
129-2019-03130002	2	RCHY	B	1	1	3/14/19	(b) (4)		3.655	(b) (4)		0.483
129-2019-05150003	3	RCHY	A	1	3	5/16/19	(b) (4)		3.677	(b) (4)		0.488
129-2019-05150003	3	RCHY	B	1	3	5/16/19	(b) (4)		3.598	(b) (4)		0.488
129-2019-08200021	4	RCHY	A	1	6	8/20/19	(b) (4)		3.550	(b) (4)		0.468
129-2019-08200021	4	RCHY	B	1	6	8/20/19	(b) (4)		3.649	(b) (4)		0.483
129-2019-11120003	5	RCHY	A	1	9	11/12/19	(b) (4)		3.710	(b) (4)		0.498
129-2019-11120003	5	RCHY	B	1	9	11/12/19	(b) (4)		3.167	(b) (4)		0.452
129-2020-02100001	6	RCHY	A	1	12	2/10/20	(b) (4)		3.907	(b) (4)		0.504
129-2020-02100001	6	RCHY	B	1	12	2/10/20	(b) (4)		3.376	(b) (4)		0.465
129-2020-05060003	7	RCHY	A	1	15	5/6/20	(b) (4)		3.471	(b) (4)		0.514
129-2020-05060003	7	RCHY	B	1	15	5/6/20	(b) (4)		2.911	(b) (4)		0.441
129-2020-08100003	8	RCHY	A	1	18	8/14/20	(b) (4)		3.958	(b) (4)		0.473
129-2020-08100003	8	RCHY	B	1	18	8/14/20	(b) (4)		4.260	(b) (4)		0.555
129-2021-02150012	9	RCHY	A	1	24	2/15/21	(b) (4)		3.500	(b) (4)		0.519
129-2021-02150012	9	RCHY	B	1	24	2/15/21	(b) (4)		3.103	(b) (4)		0.483

129-2019-03130001	1	RCHY	A	2	0	3/14/2019	(b) (4)	3.378	(b) (4)	0.420
129-2019-03130001	1	RCHY	B	2	0	3/14/2019	(b) (4)	3.661	(b) (4)	0.451
129-2019-04150021	2	RCHY	A	2	1	4/16/2019	(b) (4)	3.913	(b) (4)	0.481
129-2019-04150021	2	RCHY	B	2	1	4/16/2019	(b) (4)	3.355	(b) (4)	0.439
2019-0185	3	RCHY	A	2	3	6/13/2019	(b) (4)	3.123	(b) (4)	0.396
2019-0185	3	RCHY	B	2	3	6/13/2019	(b) (4)	3.395	(b) (4)	0.435
129-2019-09130001	4	RCHY	A	2	6	9/13/2019	(b) (4)	3.410	(b) (4)	0.427
129-2019-09130001	4	RCHY	B	2	6	9/13/2019	(b) (4)	3.355	(b) (4)	0.417
129-2019-12100004	5	RCHY	A	2	9	12/10/2019	(b) (4)	3.292	(b) (4)	0.466
129-2019-12100004	5	RCHY	B	2	9	12/10/2019	(b) (4)	3.052	(b) (4)	0.439
129-2020-03170004	6	RCHY	A	2	12	3/17/2020	(b) (4)	3.631	(b) (4)	0.427
129-2020-03170004	6	RCHY	B	2	12	3/17/2020	(b) (4)	4.024	(b) (4)	0.470
129-2020-06150003	7	RCHY	A	2	15	6/15/2020	(b) (4)	3.586	(b) (4)	0.476
129-2020-06150003	7	RCHY	B	2	15	6/15/2020	(b) (4)	2.852	(b) (4)	0.401
129-2020-09140003	8	RCHY	A	2	18	9/18/2020	(b) (4)	3.577	(b) (4)	0.367
129-2020-09140003	8	RCHY	B	2	18	9/18/2020	(b) (4)	4.592	(b) (4)	0.433
129-2021-03080007	9	RCHY	A	2	24	3/8/2021	(b) (4)	3.575	(b) (4)	0.467
129-2021-03080007	9	RCHY	B	2	24	3/8/2021	(b) (4)	3.317	(b) (4)	0.461
129-2019-04090001	1	RCHY	A	3	0	10-Apr-19	(b) (4)	3.401	(b) (4)	0.450
129-2019-04090001	1	RCHY	B	3	0	10-Apr-19	(b) (4)	3.246	(b) (4)	0.440
129-2019-05070001	2	RCHY	A	3	1	8-May-19	(b) (4)	3.105	(b) (4)	0.410
129-2019-05070001	2	RCHY	B	3	1	8-May-19	(b) (4)	3.228	(b) (4)	0.420
129-2019-07080023	3	RCHY	A	3	3	8-Jul-19	(b) (4)	2.783	(b) (4)	0.371
129-2019-07080023	3	RCHY	B	3	3	8-Jul-19	(b) (4)	2.872	(b) (4)	0.372
129-2019-10020001	4	RCHY	A	3	6	2-Oct-19	(b) (4)	3.268	(b) (4)	0.412
129-2019-10020001	4	RCHY	B	3	6	2-Oct-19	(b) (4)	3.242	(b) (4)	0.419
129-2020-01090008	5	RCHY	A	3	9	9-Jan-20	(b) (4)	2.984	(b) (4)	0.422
129-2020-01090008	5	RCHY	B	3	9	9-Jan-20	(b) (4)	3.530	(b) (4)	0.465

129-2020-04080035	6	RCHY	A	3	12	8-Apr-20	(b) (4)	2.952	(b) (4)	0.419
129-2020-04080035	6	RCHY	B	3	12	8-Apr-20	(b) (4)	3.155	(b) (4)	0.415
129-2020-07140081	7	RCHY	A	3	15	16-Jul-20	(b) (4)	3.773	(b) (4)	0.390
129-2020-07140081	7	RCHY	B	3	15	16-Jul-20	(b) (4)	3.338	(b) (4)	0.366
129-2020-10080003	8	RCHY	A	3	18	12-Oct-20	(b) (4)	3.576	(b) (4)	0.425
129-2020-10080003	8	RCHY	B	3	18	12-Oct-20	(b) (4)	3.838	(b) (4)	0.465
129-2021-04130041	9	RCHY	A	3	24	20-Apr-21	(b) (4)	2.874	(b) (4)	0.437
129-2021-04130041	9	RCHY	B	3	24	20-Apr-21	(b) (4)	3.370	(b) (4)	0.479

(b) (4)

(b) (4)

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(b) (6)

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-003402-01

Received On: 18Jun2021
Reported On: 30Jun2021

(b) (4) Sample Code: 129-2021-06180031	Sample Registration Date: 18Jun2021
Client Sample Code: 2450 X 165 63435 #1	Condition Upon Receipt: acceptable, 22.5°C
Sample Description: Batch 1 06/15/2021 4:26	Sample Reference: PX BIN C

QD104 - Fiber, Dietary Insoluble	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	30Jun2021	1

Parameter	Result	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)		0.2 %
Fiber, Dietary, Insoluble			0.2 %

QD148 - Moisture by Vacuum Oven	Reference	Accreditation	Completed	Sub
	AOAC 925.09	ISO/IEC 17025:2017 A2LA 2927.01	30Jun2021	1

Parameter	Result	Result	LOQ
Moisture and Volatiles - Vacuum Oven	(b) (4)		0.5 %
Moisture and Volatiles - Vacuum Oven			0.5 %

QD230 - Fiber, Total Dietary	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	30Jun2021	1

Parameter	Result	Result	LOQ
Total Dietary Fiber	(b) (4)		0.2 %
Total Dietary Fiber			0.2 %

QD256 - Fiber, Dietary Soluble	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	30Jun2021	1

Parameter	Result	Result	LOQ
Fiber, Dietary, Soluble	(b) (4)		0.2 %
Fiber, Dietary, Soluble			0.2 %

(b) (6)
500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-003402-01

Received On: 18Jun2021
Reported On: 30Jun2021

(b) (4) Sample Code:	129-2021-06180031	Sample Registration Date:	18Jun2021
Client Sample Code:	2450 X 165 63435 #1	Condition Upon Receipt:	acceptable, 22.5°C
Sample Description:	Batch 1 06/15/2021 4:26	Sample Reference:	PX BIN C

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 30Jun2021	Sub 1
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Parameter	Result	Result	LOQ
Water Activity at 25°C	(b) (4)		0.03 No unit
Water Activity at 25°C			0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference In thod (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 30Jun2021
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Parameter	Result	LOQ
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
Total Zeaxanthin		0.03 µg/g
Total Zeaxanthin		0.03 µg/g

Subcontracting partners:
1 - (b) (4)

(b) (6)

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St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-003402-01

Received On: 18Jun2021
Reported On: 30Jun2021

Results shown in this report relate solely to the item submitted for analysis. | Any opinions/interpretations expressed on this report are given independent of the laboratory's scope of accreditation. | All results are reported on an "As Received" basis unless otherwise stated. | Reports shall not be reproduced except in full without written permission of (b)(6). | All work done in accordance with (b)(6) General Terms and Conditions of Sale: (b)(6)/terms_and_conditions.pdf | √ Indicates a subcontract test to a different lab. Lab(s) are listed at end of the report. For further details about the performing labs please contact your customer service contact at (b)(6) Measurement of uncertainty can be obtained upon request.

(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)

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St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-003403-01

Received On: 18Jun2021
Reported On: 30Jun2021

(b) (4) Sample Code: 129-2021-06180032	Sample Registration Date: 18Jun2021
Client Sample Code: 2450 X 165 63435 #2	Condition Upon Receipt: acceptable, 22.5°C
Sample Description: Batch 1 06/15/2021 4:41	Sample Reference: PX BIN C

QD104 - Fiber, Dietary Insoluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 30Jun2021	Sub 1
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Parameter	Result	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)		0.2 %
Fiber, Dietary, Insoluble			0.2 %

QD148 - Moisture by Vacuum Oven	Reference AOAC 925.09	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 30Jun2021	Sub 1
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Parameter	Result	Result	LOQ
Moisture and Volatiles - Vacuum Oven	(b) (4)		0.5 %
Moisture and Volatiles - Vacuum Oven			0.5 %

QD230 - Fiber, Total Dietary	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 30Jun2021	Sub 1
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Parameter	Result	Result	LOQ
Total Dietary Fiber	(b) (4)		0.2 %
Total Dietary Fiber			0.2 %

QD256 - Fiber, Dietary Soluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 30Jun2021	Sub 1
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Parameter	Result	Result	LOQ
Fiber, Dietary, Soluble	(b) (4)		0.2 %
Fiber, Dietary, Soluble			0.2 %

(b) (6)
500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-003403-01

Received On: 18Jun2021
Reported On: 30Jun2021

(b) (4) Sample Code:	129-2021-06180032	Sample Registration Date:	18Jun2021
Client Sample Code:	2450 X 165 63435 #2	Condition Upon Receipt:	acceptable, 22.5°C
Sample Description:	Batch 1 06/15/2021 4:41	Sample Reference:	PX BIN C

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 30Jun2021	Sub 1
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Parameter	Result	Result	LOQ
Water Activity at 25°C	(b) (4)		0.03 No unit
Water Activity at 25°C			0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference Internal Method (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 30Jun2021
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Parameter	Result	LOQ
.		0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
Total Zeaxanthin		0.03 µg/g
Total Zeaxanthin		0.03 µg/g

Subcontracting partners:
1 - (b) (4)

(b) (6)

Royal Canin

Client Code: YI0000062

(b) (6)

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-003403-01

Received On: 18Jun2021

Reported On: 30Jun2021

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-003404-01

Received On: 18Jun2021
Reported On: 30Jun2021

(b) (4) Sample Code: 129-2021-06180033		Sample Registration Date: 18Jun2021		
Client Sample Code: 2450 X 165 63435 #3		Condition Upon Receipt: acceptable, 22.5°C		
Sample Description: Batch 1 06/15/2021 4:57		Sample Reference: PX BIN C		
QD104 - Fiber, Dietary Insoluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 30Jun2021	Sub 1
Parameter	Result	Result	LOQ	
Fiber, Dietary, Insoluble	(b) (4)		0.2 %	
Fiber, Dietary, Insoluble			0.2 %	
QD148 - Moisture by Vacuum Oven	Reference AOAC 925.09	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 30Jun2021	Sub 1
Parameter	Result	Result	LOQ	
Moisture and Volatiles - Vacuum Oven	(b) (4)		0.5 %	
Moisture and Volatiles - Vacuum Oven			0.5 %	
QD230 - Fiber, Total Dietary	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 30Jun2021	Sub 1
Parameter	Result	Result	LOQ	
Total Dietary Fiber	(b) (4)		0.2 %	
Total Dietary Fiber			0.2 %	
QD256 - Fiber, Dietary Soluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 30Jun2021	Sub 1
Parameter	Result	Result	LOQ	
Fiber, Dietary, Soluble	(b) (4)		0.2 %	
Fiber, Dietary, Soluble			0.2 %	

(b) (6)
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ANALYTICAL REPORT

AR-21-YI-003404-01

Received On: 18Jun2021
Reported On: 30Jun2021

(b) (4) Sample Code:	129-2021-06180033	Sample Registration Date:	18Jun2021
Client Sample Code:	2450 X 165 63435 #3	Condition Upon Receipt:	acceptable, 22.5°C
Sample Description:	Batch 1 06/15/2021 4:57	Sample Reference:	PX BIN C

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 30Jun2021	Sub 1
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Parameter	Result	Result	LOQ
Water Activity at 25°C	(b) (4)		0.03 No unit
Water Activity at 25°C			0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference In (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 30Jun2021
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Parameter	Result	LOQ
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
Total Zeaxanthin		0.03 µg/g
Total Zeaxanthin		0.03 µg/g

Subcontracting partners:

1 - (b) (4)

(b)(6)

ANALYTICAL REPORT

(b) (6)
500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-21-YI-003404-01

Received On: 18Jun2021
Reported On: 30Jun2021

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-003405-01

Received On: 18Jun2021
Reported On: 30Jun2021

(b) (4) Sample Code: 129-2021-06180034		Sample Registration Date: 18Jun2021		
Client Sample Code: 2450 X 165 63435 #4		Condition Upon Receipt: acceptable, 22.5°C		
Sample Description: Batch 1 06/15/2021 5:08		Sample Reference: PX BIN C		
QD104 - Fiber, Dietary Insoluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 30Jun2021	Sub 1
Parameter	Result	Result	LOQ	
Fiber, Dietary, Insoluble	(b) (4)		0.2 %	
Fiber, Dietary, Insoluble			0.2 %	
QD148 - Moisture by Vacuum Oven	Reference AOAC 925.09	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 30Jun2021	Sub 1
Parameter	Result	Result	LOQ	
Moisture and Volatiles - Vacuum Oven	(b) (4)		0.5 %	
Moisture and Volatiles - Vacuum Oven			0.5 %	
QD230 - Fiber, Total Dietary	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 30Jun2021	Sub 1
Parameter	Result	Result	LOQ	
Total Dietary Fiber	(b) (4)		0.2 %	
Total Dietary Fiber			0.2 %	
QD256 - Fiber, Dietary Soluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 30Jun2021	Sub 1
Parameter	Result	Result	LOQ	
Fiber, Dietary, Soluble	(b) (4)		0.2 %	
Fiber, Dietary, Soluble			0.2 %	

(b) (6)
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ANALYTICAL REPORT

AR-21-YI-003405-01

Received On: 18Jun2021
Reported On: 30Jun2021

(b) (4) Sample Code:	129-2021-06180034	Sample Registration Date:	18Jun2021
Client Sample Code:	2450 X 165 63435 #4	Condition Upon Receipt:	acceptable, 22.5°C
Sample Description:	Batch 1 06/15/2021 5:08	Sample Reference:	PX BIN C

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 30Jun2021	Sub 1
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Parameter	Result	Result	LOQ
Water Activity at 25°C	(b) (4)		0.03 No unit
Water Activity at 25°C			0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference In (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 30Jun2021
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Parameter	Result	LOQ
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
Total Zeaxanthin		0.03 µg/g
Total Zeaxanthin		0.03 µg/g

Subcontracting partners:
1 (b) (4)

(b) (6)

(b) (6)
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St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-003405-01

Received On: 18Jun2021
Reported On: 30Jun2021

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)

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St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-003406-01

Received On: 18Jun2021
Reported On: 30Jun2021

(b) (4) Sample Code: 129-2021-06180042		Sample Registration Date: 18Jun2021		
Client Sample Code: 2450 X 165 63435 #12		Condition Upon Receipt: acceptable, 22.5°C		
Sample Description: Batch 1 06/15/2021 6:47		Sample Reference: PX BIN D		
QD104 - Fiber, Dietary Insoluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 30Jun2021	Sub 1
Parameter	Result	Result	LOQ	
Fiber, Dietary, Insoluble	(b) (4)		0.2 %	
Fiber, Dietary, Insoluble			0.2 %	
QD148 - Moisture by Vacuum Oven	Reference AOAC 925.09	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 30Jun2021	Sub 1
Parameter	Result	Result	LOQ	
Moisture and Volatiles - Vacuum Oven	(b) (4)		0.5 %	
Moisture and Volatiles - Vacuum Oven			0.5 %	
QD230 - Fiber, Total Dietary	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 30Jun2021	Sub 1
Parameter	Result	Result	LOQ	
Total Dietary Fiber	(b) (4)		0.2 %	
Total Dietary Fiber			0.2 %	
QD256 - Fiber, Dietary Soluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 30Jun2021	Sub 1
Parameter	Result	Result	LOQ	
Fiber, Dietary, Soluble	(b) (4)		0.2 %	
Fiber, Dietary, Soluble			0.2 %	

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-21-YI-003406-01

Received On: 18Jun2021
Reported On: 30Jun2021

(b) (4) Sample Code:	129-2021-06180042	Sample Registration Date:	18Jun2021
Client Sample Code:	2450 X 165 63435 #12	Condition Upon Receipt:	acceptable, 22.5°C
Sample Description:	Batch 1 06/15/2021 6:47	Sample Reference:	PX BIN D

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 30Jun2021	Sub 1
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Parameter	Result	Result	LOQ
Water Activity at 25°C	(b) (4)		0.03 No unit
Water Activity at 25°C			0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference In (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 30Jun2021
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Parameter	Result	LOQ
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
Total Zeaxanthin		0.03 µg/g
Total Zeaxanthin		0.03 µg/g

Subcontracting partners:

1 - (b) (4)

(b) (6)

(b) (6)
500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-003406-01

Received On: 18Jun2021
Reported On: 30Jun2021

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)

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St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-003458-01

Received On: 18Jun2021
Reported On: 01Jul2021

(b) (4) Sample Code: 129-2021-06180035	Sample Registration Date: 18Jun2021
Client Sample Code: 2450 X 165 63435 #5	Condition Upon Receipt: acceptable, 22.5°C
Sample Description: Batch 1 06/15/2021 5:29	Sample Reference: PX BIN C

QD104 - Fiber, Dietary Insoluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
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Parameter	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)	0.2 %
Fiber, Dietary, Insoluble		0.2 %

QD148 - Moisture by Vacuum Oven	Reference AOAC 925.09	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
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Parameter	Result	LOQ
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %
Moisture and Volatiles - Vacuum Oven		0.5 %

QD230 - Fiber, Total Dietary	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
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Parameter	Result	LOQ
Total Dietary Fiber	(b) (4)	0.2 %
Total Dietary Fiber		0.2 %

QD256 - Fiber, Dietary Soluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
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Parameter	Result	LOQ
Fiber, Dietary, Soluble	(b) (4)	0.2 %
Fiber, Dietary, Soluble		0.2 %

(b) (6)
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ANALYTICAL REPORT

AR-21-YI-003458-01

Received On: 18Jun2021
Reported On: 01Jul2021

(b) (4) Sample Code:	129-2021-06180035	Sample Registration Date:	18Jun2021
Client Sample Code:	2450 X 165 63435 #5	Condition Upon Receipt:	acceptable, 22.5°C
Sample Description:	Batch 1 06/15/2021 5:29	Sample Reference:	PX BIN C

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
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Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference I d (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 30Jun2021
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Parameter	Result	LOQ
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
Total Zeaxanthin		0.03 µg/g
Total Zeaxanthin		0.03 µg/g

Subcontracting partners:

1- (b) (4)

(b) (6)

ANALYTICAL REPORT

(b) (6)
500 Fountain Lakes Blvd, Suite 100
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AR-21-YI-003458-01

Received On: 18Jun2021
Reported On: 01Jul2021

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)

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St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-003459-01

Received On: 18Jun2021
Reported On: 01Jul2021

(b) (4) Sample Code: 129-2021-06180036		Sample Registration Date: 18Jun2021		
Client Sample Code: 2450 X 165 63435 #6		Condition Upon Receipt: acceptable, 22.5°C		
Sample Description: Batch 1 06/15/2021 5:46		Sample Reference: PX BIN C		
QD104 - Fiber, Dietary Insoluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
Parameter	Result		LOQ	
Fiber, Dietary, Insoluble	(b) (4)		0.2 %	
Fiber, Dietary, Insoluble			0.2 %	
QD148 - Moisture by Vacuum Oven	Reference AOAC 925.09	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
Parameter	Result		LOQ	
Moisture and Volatiles - Vacuum Oven	(b) (4)		0.5 %	
Moisture and Volatiles - Vacuum Oven			0.5 %	
QD230 - Fiber, Total Dietary	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
Parameter	Result		LOQ	
Total Dietary Fiber	(b) (4)		0.2 %	
Total Dietary Fiber			0.2 %	
QD256 - Fiber, Dietary Soluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
Parameter	Result		LOQ	
Fiber, Dietary, Soluble	(b) (4)		0.2 %	
Fiber, Dietary, Soluble			0.2 %	

(b) (6)
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ANALYTICAL REPORT

AR-21-YI-003459-01

Received On: 18Jun2021
Reported On: 01Jul2021

(b) (4) Sample Code:	129-2021-06180036	Sample Registration Date:	18Jun2021
Client Sample Code:	2450 X 165 63435 #6	Condition Upon Receipt:	acceptable, 22.5°C
Sample Description:	Batch 1 06/15/2021 5:46	Sample Reference:	PX BIN C

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
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Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference I d (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 30Jun2021
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Parameter	Result	LOQ
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

Subcontracting partners:

1 - (b) (4)

(b) (6)

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
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AR-21-YI-003459-01

Received On: 18Jun2021
Reported On: 01Jul2021

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)
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ANALYTICAL REPORT

AR-21-YI-003460-01

Received On: 18Jun2021
Reported On: 01Jul2021

(b) (4) Sample Code: 129-2021-06180037		Sample Registration Date: 18Jun2021		
Client Sample Code: 2450 X 165 63435 #7		Condition Upon Receipt: acceptable, 22.5°C		
Sample Description: Batch 1 06/15/2021 5:52		Sample Reference: PX BIN C		
QD104 - Fiber, Dietary Insoluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
Parameter	Result		LOQ	
Fiber, Dietary, Insoluble	(b) (4)		0.2 %	
Fiber, Dietary, Insoluble			0.2 %	
QD148 - Moisture by Vacuum Oven	Reference AOAC 925.09	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
Parameter	Result		LOQ	
Moisture and Volatiles - Vacuum Oven	(b) (4)		0.5 %	
Moisture and Volatiles - Vacuum Oven			0.5 %	
QD230 - Fiber, Total Dietary	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
Parameter	Result		LOQ	
Total Dietary Fiber	(b) (4)		0.2 %	
Total Dietary Fiber			0.2 %	
QD256 - Fiber, Dietary Soluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
Parameter	Result		LOQ	
Fiber, Dietary, Soluble	(b) (4)		0.2 %	
Fiber, Dietary, Soluble			0.2 %	

(b) (6)
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ANALYTICAL REPORT

AR-21-YI-003460-01

Received On: 18Jun2021
Reported On: 01Jul2021

(b) (4) Sample Code:	129-2021-06180037	Sample Registration Date:	18Jun2021
Client Sample Code:	2450 X 165 63435 #7	Condition Upon Receipt:	acceptable, 22.5°C
Sample Description:	Batch 1 06/15/2021 5:52	Sample Reference:	PX BIN C

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
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Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference In d (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 30Jun2021
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Parameter	Result	LOQ
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

Subcontracting partners:
1 (b) (4)

(b) (6)

Royal Canin

Client Code: YI0000062

(b) (6)
500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-003460-01

Received On: 18Jun2021
Reported On: 01Jul2021

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-003461-01

Received On: 18Jun2021
Reported On: 01Jul2021

(b) (4) Sample Code: 129-2021-06180038	Sample Registration Date: 18Jun2021			
Client Sample Code: 2450 X 165 63435 #8	Condition Upon Receipt: acceptable, 22.5°C			
Sample Description: Batch 1 06/15/2021 6:02	Sample Reference: PX BIN C			
QD104 - Fiber, Dietary Insoluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
Parameter	Result		LOQ	
Fiber, Dietary, Insoluble	(b) (4)		0.2 %	
Fiber, Dietary, Insoluble			0.2 %	
QD148 - Moisture by Vacuum Oven	Reference AOAC 925.09	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
Parameter	Result		LOQ	
Moisture and Volatiles - Vacuum Oven	(b) (4)		0.5 %	
Moisture and Volatiles - Vacuum Oven			0.5 %	
QD230 - Fiber, Total Dietary	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
Parameter	Result		LOQ	
Total Dietary Fiber	(b) (4)		0.2 %	
Total Dietary Fiber			0.2 %	
QD256 - Fiber, Dietary Soluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
Parameter	Result		LOQ	
Fiber, Dietary, Soluble	(b) (4)		0.2 %	
Fiber, Dietary, Soluble			0.2 %	

(b) (6)
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ANALYTICAL REPORT

AR-21-YI-003461-01

Received On: 18Jun2021
Reported On: 01Jul2021

(b) (4) Sample Code:	129-2021-06180038	Sample Registration Date:	18Jun2021
Client Sample Code:	2450 X 165 63435 #8	Condition Upon Receipt:	acceptable, 22.5°C
Sample Description:	Batch 1 06/15/2021 6:02	Sample Reference:	PX BIN C

QQ167 - Water Activity	Reference	Accreditation	Completed	Sub
	AOAC 978.18 mod.	ISO/IEC 17025:2017 A2LA 2927.01	01Jul2021	1

Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference	Accreditation	Completed
	In od (HPLC) - ECT	ISO/IEC 17025:2017 A2LA 5492.01	30Jun2021

Parameter	Result	LOQ
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

Subcontracting partners:

1 - (b) (4)

(b) (6)

(b) (6)
500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-003461-01

Received On: 18Jun2021
Reported On: 01Jul2021

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)
500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-003462-01

Received On: 18Jun2021
Reported On: 01Jul2021

(b) (4) Sample Code: 129-2021-06180039	Sample Registration Date: 18Jun2021
Client Sample Code: 2450 X 165 63435 #9	Condition Upon Receipt: acceptable, 22.5°C
Sample Description: Batch 1 06/15/2021 6:15	Sample Reference: PX BIN D

QD104 - Fiber, Dietary Insoluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
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Parameter	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)	0.2 %
Fiber, Dietary, Insoluble	(b) (4)	0.2 %

QD148 - Moisture by Vacuum Oven	Reference AOAC 925.09	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
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Parameter	Result	LOQ
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %

QD230 - Fiber, Total Dietary	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
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Parameter	Result	LOQ
Total Dietary Fiber	(b) (4)	0.2 %
Total Dietary Fiber	(b) (4)	0.2 %

QD256 - Fiber, Dietary Soluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
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Parameter	Result	LOQ
Fiber, Dietary, Soluble	(b) (4)	0.2 %
Fiber, Dietary, Soluble	(b) (4)	0.2 %

(b) (6)
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ANALYTICAL REPORT

AR-21-YI-003462-01

Received On: 18Jun2021
Reported On: 01Jul2021

(b) (4) Sample Code:	129-2021-06180039	Sample Registration Date:	18Jun2021
Client Sample Code:	2450 X 165 63435 #9	Condition Upon Receipt:	acceptable, 22.5°C
Sample Description:	Batch 1 06/15/2021 6:15	Sample Reference:	PX BIN D

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
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Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference In (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 30Jun2021
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Parameter	Result	LOQ
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
Total Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	

Subcontracting partners:
(b) (4)

(b) (6)

Royal Canin

Client Code: YI0000062

ANALYTICAL REPORT

(b) (6)
500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-21-YI-003462-01

Received On: 18Jun2021
Reported On: 01Jul2021

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)

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ANALYTICAL REPORT

AR-21-YI-003463-01

Received On: 18Jun2021

Reported On: 01Jul2021

(b) (4) Sample Code: 129-2021-06180040		Sample Registration Date: 18Jun2021		
Client Sample Code: 2450 X 165 63435 #10		Condition Upon Receipt: acceptable, 22.5°C		
Sample Description: Batch 1 06/15/2021 6:25		Sample Reference: PX BIN D		
QD104 - Fiber, Dietary Insoluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
Parameter	Result		LOQ	
Fiber, Dietary, Insoluble	(b) (4)		0.2 %	
Fiber, Dietary, Insoluble			0.2 %	
QD148 - Moisture by Vacuum Oven	Reference AOAC 925.09	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
Parameter	Result		LOQ	
Moisture and Volatiles - Vacuum Oven	(b) (4)		0.5 %	
Moisture and Volatiles - Vacuum Oven			0.5 %	
QD230 - Fiber, Total Dietary	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
Parameter	Result		LOQ	
Total Dietary Fiber	(b) (4)		0.2 %	
Total Dietary Fiber			0.2 %	
QD256 - Fiber, Dietary Soluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
Parameter	Result		LOQ	
Fiber, Dietary, Soluble	(b) (4)		0.2 %	
Fiber, Dietary, Soluble			0.2 %	

(b) (6)
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ANALYTICAL REPORT

AR-21-YI-003463-01

Received On: 18Jun2021
Reported On: 01Jul2021

(b) (4) Sample Code:	129-2021-06180040	Sample Registration Date:	18Jun2021
Client Sample Code:	2450 X 165 63435 #10	Condition Upon Receipt:	acceptable, 22.5°C
Sample Description:	Batch 1 06/15/2021 6:25	Sample Reference:	PX BIN D

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Jul2021	Sub 1
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Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference I d (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 30Jun2021
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Parameter	Result	LOQ
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

Subcontracting partners:
1 (b) (4) (Des Moines), IA

(b) (6)

Royal Canin

Client Code: YI0000062

(b) (6)

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St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-003463-01

Received On: 18Jun2021

Reported On: 01Jul2021

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)

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ANALYTICAL REPORT

AR-21-YI-003474-01

Received On: 18Jun2021
Reported On: 02Jul2021

(b) (4) Sample Code: 129-2021-06180041	Sample Registration Date: 18Jun2021
Client Sample Code: 2450 X 165 63435 #11	Condition Upon Receipt: acceptable, 22.5°C
Sample Description: Batch 1 06/15/2021 6:37	Sample Reference: PX BIN D

QD104 - Fiber, Dietary Insoluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 02Jul2021	Sub 1
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Parameter	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)	0.2 %
Fiber, Dietary, Insoluble		0.2 %

QD148 - Moisture by Vacuum Oven	Reference AOAC 925.09	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 02Jul2021	Sub 1
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Parameter	Result	LOQ
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %
Moisture and Volatiles - Vacuum Oven		0.5 %

QD230 - Fiber, Total Dietary	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 02Jul2021	Sub 1
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Parameter	Result	LOQ
Total Dietary Fiber	(b) (4)	0.2 %
Total Dietary Fiber		0.2 %

QD256 - Fiber, Dietary Soluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 02Jul2021	Sub 1
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Parameter	Result	LOQ
Fiber, Dietary, Soluble	(b) (4)	0.2 %
Fiber, Dietary, Soluble		0.2 %

(b) (6)
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ANALYTICAL REPORT

AR-21-YI-003474-01

Received On: 18Jun2021
Reported On: 02Jul2021

(b) (4) Sample Code:	129-2021-06180041	Sample Registration Date:	18Jun2021
Client Sample Code:	2450 X 165 63435 #11	Condition Upon Receipt:	acceptable, 22.5°C
Sample Description:	Batch 1 06/15/2021 6:37	Sample Reference:	PX BIN D

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 02Jul2021	Sub 1
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Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference I d (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 30Jun2021
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Parameter	Result	LOQ
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

Subcontracting partners:
1 - (b) (4)

(b) (6)

Royal Canin

Client Code: YI0000062

(b) (6)

ANALYTICAL REPORT

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AR-21-YI-003474-01

Received On: 18Jun2021
Reported On: 02Jul2021

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)

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ANALYTICAL REPORT

AR-21-YI-004480-01

Received On: 23Jul2021
Reported On: 11Aug2021

(b) (4) Sample Code: 129-2021-07230028		Sample Registration Date: 23Jul2021		
Client Sample Code: 2450 X 165 63601 #1		Condition Upon Receipt: acceptable, 20.9°C		
Sample Description: BATCH 2(7/20/2021) 18:47		Sample Reference: PX BIN:B		
QD104 - Fiber, Dietary Insoluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 06Aug2021	Sub 1

Parameter	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)	0.2 %
Fiber, Dietary, Insoluble	(b) (4)	0.2 %

QD148 - Moisture by Vacuum Oven	Reference AOAC 925.09	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 06Aug2021	Sub 1
Parameter	Result	LOQ		
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %		
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %		

QD230 - Fiber, Total Dietary	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 06Aug2021	Sub 1
Parameter	Result	LOQ		
Total Dietary Fiber	(b) (4)	0.2 %		
Total Dietary Fiber	(b) (4)	0.2 %		

QD256 - Fiber, Dietary Soluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 06Aug2021	Sub 1
Parameter	Result	LOQ		
Fiber, Dietary, Soluble	(b) (4)	0.2 %		
Fiber, Dietary, Soluble	(b) (4)	0.2 %		

(b) (6)
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 St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-004480-01

Received On: 23Jul2021
 Reported On: 11Aug2021

(b) (4) Sample Code: 129-2021-07230028	Sample Registration Date: 23Jul2021
Client Sample Code: 2450 X 165 63601 #1	Condition Upon Receipt: acceptable, 20.9°C
Sample Description: BATCH 2(7/20/2021) 18:47	Sample Reference: PX BIN:B

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 06Aug2021	Sub 1
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Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference I HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 11Aug2021
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Parameter	Result	LOQ
Canthaxanthin	(b) (4)	0.03 µg/g
Canthaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
trans-Lutein		0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	

Subcontracting partners:
 1 - (b) (4)

(b) (6)
500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-004480-01

Received On: 23Jul2021
Reported On: 11Aug2021

(b) (6)

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)

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ANALYTICAL REPORT

AR-21-YI-004481-01

Received On: 23Jul2021
Reported On: 11Aug2021

(b) (4) Sample Code: 129-2021-07230029		Sample Registration Date: 23Jul2021		
Client Sample Code: 2450 X 165 63601 #2		Condition Upon Receipt: acceptable, 20.9°C		
Sample Description: BATCH 2 (7/20/2021) 19:04		Sample Reference: PX BIN:B		
QD104 - Fiber, Dietary Insoluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 06Aug2021	Sub 1
Parameter	Result		LOQ	
Fiber, Dietary, Insoluble	(b) (4)		0.2 %	
Fiber, Dietary, Insoluble			0.2 %	
QD148 - Moisture by Vacuum Oven	Reference AOAC 925.09	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 06Aug2021	Sub 1
Parameter	Result		LOQ	
Moisture and Volatiles - Vacuum Oven	(b) (4)		0.5 %	
Moisture and Volatiles - Vacuum Oven			0.5 %	
QD230 - Fiber, Total Dietary	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 06Aug2021	Sub 1
Parameter	Result		LOQ	
Total Dietary Fiber	(b) (4)		0.2 %	
Total Dietary Fiber			0.2 %	
QD256 - Fiber, Dietary Soluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 06Aug2021	Sub 1
Parameter	Result		LOQ	
Fiber, Dietary, Soluble	(b) (4)		0.2 %	
Fiber, Dietary, Soluble			0.2 %	

(b) (6)
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ANALYTICAL REPORT

AR-21-YI-004481-01

Received On: 23Jul2021
 Reported On: 11Aug2021

(b) (4) Sample Code: 129-2021-07230029 **Sample Registration Date:** 23Jul2021
Client Sample Code: 2450 X 165 63601 #2 **Condition Upon Receipt:** acceptable, 20.9°C
Sample Description: BATCH 2 (7/20/2021) 19:04 **Sample Reference:** PX BIN:B

Parameter	Reference	Accreditation	Completed	Sub
QQ167 - Water Activity	AOAC 978.18 mod.	ISO/IEC 17025:2017 A2LA 2927.01	06Aug2021	1

Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

Parameter	Reference	Accreditation	Completed
YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	I (HPLC) - ECT	ISO/IEC 17025:2017 A2LA 5492.01	11Aug2021

Parameter	Result	LOQ
Canthaxanthin	(b) (4)	0.03 µg/g
Canthaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
trans-Lutein		0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	

Subcontracting partners:
 1 - (b) (4)

(b) (6)
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St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-004481-01

Received On: 23Jul2021
Reported On: 11Aug2021

(b) (6)

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(b) (4)

(b) (4)

Royal Canin

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ANALYTICAL REPORT

AR-21-YI-004482-01

Received On: 23Jul2021
Reported On: 11Aug2021

(b) (4) Sample Code: 129-2021-07230030		Sample Registration Date: 23Jul2021		
Client Sample Code: 2450 X 165 63601 #3		Condition Upon Receipt: acceptable, 20.9°C		
Sample Description: BATCH 2 (7/20/2021) 19:16		Sample Reference: PX BIN:B		
QD104 - Fiber, Dietary Insoluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 06Aug2021	Sub 1

Parameter	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)	0.2 %
Fiber, Dietary, Insoluble	(b) (4)	0.2 %

QD148 - Moisture by Vacuum Oven	Reference AOAC 925.09	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 06Aug2021	Sub 1
Parameter	Result	LOQ		
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %		
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %		

QD230 - Fiber, Total Dietary	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 06Aug2021	Sub 1
Parameter	Result	LOQ		
Total Dietary Fiber	(b) (4)	0.2 %		
Total Dietary Fiber	(b) (4)	0.2 %		

QD256 - Fiber, Dietary Soluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 06Aug2021	Sub 1
Parameter	Result	LOQ		
Fiber, Dietary, Soluble	(b) (4)	0.2 %		
Fiber, Dietary, Soluble	(b) (4)	0.2 %		

(b) (6)
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ANALYTICAL REPORT

AR-21-YI-004482-01

Received On: 23Jul2021
Reported On: 11Aug2021

(b) (4) Sample Code: 129-2021-07230030	Sample Registration Date: 23Jul2021
Client Sample Code: 2450 X 165 63601 #3	Condition Upon Receipt: acceptable, 20.9°C
Sample Description: BATCH 2 (7/20/2021) 19:16	Sample Reference: PX BIN:B

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 06Aug2021	Sub 1
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Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference In (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 11Aug2021
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Parameter	Result	LOQ
Canthaxanthin	(b) (4)	0.03 µg/g
Canthaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
trans-Lutein		0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
Total Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	

Subcontracting partners:
1- (b) (4)

(b) (6)
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ANALYTICAL REPORT

AR-21-YI-004482-01

Received On: 23Jul2021
Reported On: 11Aug2021

(b) (6)

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(b) (4)

(b) (6), (b) (4)

Royal Canin

(b) (6)

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ANALYTICAL REPORT

AR-21-YI-004483-02
Report Supersedes AR-21-YI-004483-01

Received On: 23Jul2021
Reported On: 01Sep2021

(b) (4) Sample Code: 129-2021-07230031		Sample Registration Date: 23Jul2021		
Client Sample Code: 2450 X 165 63601 #4		Condition Upon Receipt: acceptable, 20.9°C		
Sample Description: BATCH 2 (7/20/2021) 19:29		Sample Reference: PX BIN:B		

QD104 - Fiber, Dietary Insoluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 06Aug2021	Sub 1
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Parameter	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)	0.2 %
Fiber, Dietary, Insoluble		0.2 %

QD148 - Moisture by Vacuum Oven	Reference AOAC 925.09	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 06Aug2021	Sub 1
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Parameter	Result	LOQ
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %
Moisture and Volatiles - Vacuum Oven		0.5 %

QD230 - Fiber, Total Dietary	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 06Aug2021	Sub 1
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Parameter	Result	LOQ
Total Dietary Fiber	(b) (4)	0.2 %
Total Dietary Fiber		0.2 %

QD256 - Fiber, Dietary Soluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 01Sep2021	Sub 1
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Parameter	Result	LOQ
Fiber, Dietary, Soluble	(b) (4)	0.2 %
Fiber, Dietary, Soluble		0.2 %

(b) (6)
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ANALYTICAL REPORT

AR-21-YI-004483-02
Report Supersedes AR-21-YI-004483-01

Received On: 23Jul2021
Reported On: 01Sep2021

(b) (4) Sample Code: 129-2021-07230031		Sample Registration Date: 23Jul2021		
Client Sample Code: 2450 X 165 63601 #4		Condition Upon Receipt: acceptable, 20.9°C		
Sample Description: BATCH 2 (7/20/2021) 19:29		Sample Reference: PX BIN:B		

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 06Aug2021	Sub 1
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Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference In d (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 11Aug2021
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Parameter	Result	LOQ
Canthaxanthin	(b) (4)	0.03 µg/g
Canthaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
trans-Lutein		0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
Total Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	

Comments:
Report version -02 created to fix data entry error.

Subcontracting partners:
1 - (b) (4)

(b) (6)
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ANALYTICAL REPORT

AR-21-YI-004483-02
Report Supersedes AR-21-YI-004483-01

Received On: 23Jul2021
Reported On: 01Sep2021

(b) (6)

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)

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ANALYTICAL REPORT

AR-21-YI-004484-01

Received On: 23Jul2021
Reported On: 11Aug2021

(b) (4) Sample Code: 129-2021-07230032

Sample Registration Date: 23Jul2021

Client Sample Code: 2450 X 165 63601 #5

Condition Upon Receipt: acceptable, 20.9°C

Sample Description: BATCH 2 (7/20/2021) 19:41

Sample Reference: PX BIN:B

QD104 - Fiber, Dietary Insoluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 06Aug2021	Sub 1
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Parameter	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)	0.2 %
Fiber, Dietary, Insoluble		0.2 %

QD148 - Moisture by Vacuum Oven	Reference AOAC 925.09	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 06Aug2021	Sub 1
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Parameter	Result	LOQ
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %
Moisture and Volatiles - Vacuum Oven		0.5 %

QD230 - Fiber, Total Dietary	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 06Aug2021	Sub 1
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Parameter	Result	LOQ
Total Dietary Fiber	(b) (4)	0.2 %
Total Dietary Fiber		0.2 %

QD256 - Fiber, Dietary Soluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 06Aug2021	Sub 1
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Parameter	Result	LOQ
Fiber, Dietary, Soluble	(b) (4)	0.2 %
Fiber, Dietary, Soluble		0.2 %

ANALYTICAL REPORT

(b) (6)
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AR-21-YI-004484-01

Received On: 23Jul2021
Reported On: 11Aug2021

(b) (4) Sample Code: 129-2021-07230032	Sample Registration Date: 23Jul2021
Client Sample Code: 2450 X 165 63601 #5	Condition Upon Receipt: acceptable, 20.9°C
Sample Description: BATCH 2 (7/20/2021) 19:41	Sample Reference: PX BIN:B

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 06Aug2021	Sub 1
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Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference I (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 11Aug2021
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Parameter	Result	LOQ
Canthaxanthin	(b) (4)	0.03 µg/g
Canthaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
trans-Lutein		0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	

Subcontracting partners:
1 (b) (4)

(b) (6)
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ANALYTICAL REPORT

AR-21-YI-004484-01

Received On: 23Jul2021
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(b) (6)

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)

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ANALYTICAL REPORT

AR-21-YI-004485-01

Received On: 23Jul2021
Reported On: 11Aug2021

(b) (4) Sample Code: 129-2021-07230033

Sample Registration Date: 23Jul2021

Client Sample Code: 2450 X 165 63601 #5

Condition Upon Receipt: acceptable, 20.9°C

Sample Description: BATCH 2 (7/20/2021) 19:53

Sample Reference: PX BIN: C

QD104 - Fiber, Dietary Insoluble	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)	0.2 %
Fiber, Dietary, Insoluble		0.2 %

QD148 - Moisture by Vacuum Oven	Reference	Accreditation	Completed	Sub
	AOAC 925.09	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %
Moisture and Volatiles - Vacuum Oven		0.5 %

QD230 - Fiber, Total Dietary	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Total Dietary Fiber	(b) (4)	0.2 %
Total Dietary Fiber		0.2 %

QD256 - Fiber, Dietary Soluble	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Fiber, Dietary, Soluble	(b) (4)	0.2 %
Fiber, Dietary, Soluble		0.2 %

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ANALYTICAL REPORT

AR-21-YI-004485-01

Received On: 23Jul2021
Reported On: 11Aug2021

(b) (4) Sample Code: 129-2021-07230033	Sample Registration Date: 23Jul2021
Client Sample Code: 2450 X 165 63601 #5	Condition Upon Receipt: acceptable, 20.9°C
Sample Description: BATCH 2 (7/20/2021) 19:53	Sample Reference: PX BIN: C

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 09Aug2021	Sub 1
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Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference I d (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 11Aug2021
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Parameter	Result	LOQ
Canthaxanthin	(b) (4)	0.03 µg/g
Canthaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
trans-Lutein		0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin	0.03 µg/g	
cis-Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	

Subcontracting partners:
1 - (b) (4)

(b) (6)

ANALYTICAL REPORT

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AR-21-YI-004485-01

Received On: 23Jul2021
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(b) (6)

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)

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ANALYTICAL REPORT

AR-21-YI-004486-01

Received On: 23Jul2021
Reported On: 11Aug2021

(b) (4) Sample Code: 129-2021-07230034		Sample Registration Date: 23Jul2021		
Client Sample Code: 2450 X 165 63601 #6		Condition Upon Receipt: acceptable, 20.9°C		
Sample Description: BATCH 2 (7/20/2021) 20:06		Sample Reference: PX BIN: C		
QD104 - Fiber, Dietary Insoluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 09Aug2021	Sub 1

Parameter	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)	0.2 %
Fiber, Dietary, Insoluble	(b) (4)	0.2 %

QD148 - Moisture by Vacuum Oven	Reference AOAC 925.09	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 09Aug2021	Sub 1
Parameter	Result	LOQ		
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %		
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %		

QD230 - Fiber, Total Dietary	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 09Aug2021	Sub 1
Parameter	Result	LOQ		
Total Dietary Fiber	(b) (4)	0.2 %		
Total Dietary Fiber	(b) (4)	0.2 %		

QD256 - Fiber, Dietary Soluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 09Aug2021	Sub 1
Parameter	Result	LOQ		
Fiber, Dietary, Soluble	(b) (4)	0.2 %		
Fiber, Dietary, Soluble	(b) (4)	0.2 %		

(b) (6)
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ANALYTICAL REPORT

AR-21-YI-004486-01

Received On: 23Jul2021
Reported On: 11Aug2021

(b) (4) Sample Code: 129-2021-07230034	Sample Registration Date: 23Jul2021
Client Sample Code: 2450 X 165 63601 #6	Condition Upon Receipt: acceptable, 20.9°C
Sample Description: BATCH 2 (7/20/2021) 20:06	Sample Reference: PX BIN: C

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 09Aug2021	Sub 1
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Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference I d (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 11Aug2021
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Parameter	Result	LOQ
Canthaxanthin	(b) (4)	0.03 µg/g
Canthaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
trans-Lutein		0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	

Subcontracting partners:
1 (b) (4)

(b) (6)

ANALYTICAL REPORT

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AR-21-YI-004486-01

Received On: 23Jul2021
Reported On: 11Aug2021

(b) (6)

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)

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St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-004487-01

Received On: 23Jul2021
Reported On: 11Aug2021

(b) (4) Sample Code: 129-2021-07230035		Sample Registration Date: 23Jul2021		
Client Sample Code: 2450 X 165 63601 #7		Condition Upon Receipt: acceptable, 20.9°C		
Sample Description: BATCH 2 (7/20/2021) 20:17		Sample Reference: PX BIN: C		
QD104 - Fiber, Dietary Insoluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 09Aug2021	Sub 1

Parameter	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)	0.2 %
Fiber, Dietary, Insoluble	(b) (4)	0.2 %

QD148 - Moisture by Vacuum Oven	Reference AOAC 925.09	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 09Aug2021	Sub 1
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Parameter	Result	LOQ
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %

QD230 - Fiber, Total Dietary	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 09Aug2021	Sub 1
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Parameter	Result	LOQ
Total Dietary Fiber	(b) (4)	0.2 %
Total Dietary Fiber	(b) (4)	0.2 %

QD256 - Fiber, Dietary Soluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 09Aug2021	Sub 1
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Parameter	Result	LOQ
Fiber, Dietary, Soluble	(b) (4)	0.2 %
Fiber, Dietary, Soluble	(b) (4)	0.2 %

ANALYTICAL REPORT

(b) (6)
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AR-21-YI-004487-01

Received On: 23Jul2021
Reported On: 11Aug2021

(b) (4) Sample Code: 129-2021-07230035	Sample Registration Date: 23Jul2021
Client Sample Code: 2450 X 165 63601 #7	Condition Upon Receipt: acceptable, 20.9°C
Sample Description: BATCH 2 (7/20/2021) 20:17	Sample Reference: PX BIN: C

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 09Aug2021	Sub 1
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Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference In od (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 11Aug2021
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Parameter	Result	LOQ
Canthaxanthin	(b) (4)	0.03 µg/g
Canthaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
trans-Lutein		0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	

Subcontracting partners:
1 (b) (4)

(b) (6)
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St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-004487-01

Received On: 23Jul2021
Reported On: 11Aug2021

(b) (6)

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)

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ANALYTICAL REPORT

AR-21-YI-004488-01

Received On: 23Jul2021
Reported On: 11Aug2021

(b) (4) Sample Code: 129-2021-07230036

Sample Registration Date: 23Jul2021

Client Sample Code: 2450 X 165 63601 #8

Condition Upon Receipt: acceptable, 20.9°C

Sample Description: BATCH 2 (7/20/2021) 20:29

Sample Reference: PX BIN: C

QD104 - Fiber, Dietary Insoluble	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)	0.2 %
Fiber, Dietary, Insoluble	(b) (4)	0.2 %

QD148 - Moisture by Vacuum Oven	Reference	Accreditation	Completed	Sub
	AOAC 925.09	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %

QD230 - Fiber, Total Dietary	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Total Dietary Fiber	(b) (4)	0.2 %
Total Dietary Fiber	(b) (4)	0.2 %

QD256 - Fiber, Dietary Soluble	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Fiber, Dietary, Soluble	(b) (4)	0.2 %
Fiber, Dietary, Soluble	(b) (4)	0.2 %

(b) (6)
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ANALYTICAL REPORT

AR-21-YI-004488-01

Received On: 23Jul2021
 Reported On: 11Aug2021

(b) (4) 129-2021-07230036

Sample Registration Date: 23Jul2021

Client Sample Code: 2450 X 165 63601 #8

Condition Upon Receipt: acceptable, 20.9°C

Sample Description: BATCH 2 (7/20/2021) 20:29

Sample Reference: PX BIN: C

Parameter	Reference	Accreditation	Completed	Sub
QQ167 - Water Activity	AOAC 978.18 mod.	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

Parameter	Reference	Accreditation	Completed
YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	od (HPLC) - ECT	ISO/IEC 17025:2017 A2LA 5492.01	11Aug2021

Parameter	Result	LOQ
Canthaxanthin	(b) (4)	0.03 µg/g
Canthaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
trans-Lutein		0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	

Subcontracting partners:

1 - (b) (4)

(b) (6)
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ANALYTICAL REPORT

AR-21-YI-004488-01

Received On: 23Jul2021
Reported On: 11Aug2021

(b) (6)

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(b) (4)

(b) (4), (b) (6)

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(b) (6)

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ANALYTICAL REPORT

AR-21-YI-004489-01

Received On: 23Jul2021
Reported On: 11Aug2021

(b) (4) Sample Code: 129-2021-07230037

Sample Registration Date: 23Jul2021

Client Sample Code: 2450 X 165 63601 #9

Condition Upon Receipt: acceptable, 20.9°C

Sample Description: BATCH 2 (7/20/2021) 20:41

Sample Reference: PX BIN: C

QD104 - Fiber, Dietary Insoluble	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)	0.2 %
Fiber, Dietary, Insoluble		0.2 %

QD148 - Moisture by Vacuum Oven	Reference	Accreditation	Completed	Sub
	AOAC 925.09	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %
Moisture and Volatiles - Vacuum Oven		0.5 %

QD230 - Fiber, Total Dietary	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Total Dietary Fiber	(b) (4)	0.2 %
Total Dietary Fiber		0.2 %

QD256 - Fiber, Dietary Soluble	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Fiber, Dietary, Soluble	(b) (4)	0.2 %
Fiber, Dietary, Soluble		0.2 %

(b) (6)

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AR-21-YI-004489-01

Received On: 23Jul2021
Reported On: 11Aug2021

(b) (4) Sample Code: 129-2021-07230037		Sample Registration Date: 23Jul2021		
Client Sample Code: 2450 X 165 63601 #9		Condition Upon Receipt: acceptable, 20.9°C		
Sample Description: BATCH 2 (7/20/2021) 20:41		Sample Reference: PX BIN: C		

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 09Aug2021	Sub 1
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Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference I od (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 11Aug2021
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Parameter	Result	LOQ
Canthaxanthin	(b) (4)	0.03 µg/g
Canthaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
trans-Lutein		0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	

Subcontracting partners:
1 (b) (4)

(b) (6)

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AR-21-YI-004489-01

Received On: 23Jul2021
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(b) (4)

aft Technologies

Wilson, NC 27893
252-206-7071
EurofinsCraftClientServices@eurofinsUS.com

Royal Canin

Client Code: YI0000062

(b) (6)

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ANALYTICAL REPORT

AR-21-YI-004490-01

Received On: 23Jul2021
Reported On: 11Aug2021

(b) (4) Sample Code: 129-2021-07230038	Sample Registration Date: 23Jul2021
Client Sample Code: 2450 X 165 63601 #10	Condition Upon Receipt: acceptable, 20.9°C
Sample Description: BATCH 2 (7/20/2021) 20:54	Sample Reference: PX BIN: C

QD104 - Fiber, Dietary Insoluble	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)	0.2 %
Fiber, Dietary, Insoluble	(b) (4)	0.2 %

QD148 - Moisture by Vacuum Oven	Reference	Accreditation	Completed	Sub
	AOAC 925.09	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %

QD230 - Fiber, Total Dietary	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Total Dietary Fiber	(b) (4)	0.2 %
Total Dietary Fiber	(b) (4)	0.2 %

QD256 - Fiber, Dietary Soluble	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Fiber, Dietary, Soluble	(b) (4)	0.2 %
Fiber, Dietary, Soluble	(b) (4)	0.2 %

(b) (6)
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ANALYTICAL REPORT

AR-21-YI-004490-01

Received On: 23Jul2021
Reported On: 11Aug2021

(b) (4) Sample Code: 129-2021-07230038	Sample Registration Date: 23Jul2021
Client Sample Code: 2450 X 165 63601 #10	Condition Upon Receipt: acceptable, 20.9°C
Sample Description: BATCH 2 (7/20/2021) 20:54	Sample Reference: PX BIN: C

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 09Aug2021	Sub 1
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Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C		0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference od (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 11Aug2021
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Parameter	Result	LOQ
Canthaxanthin	(b) (4)	0.03 µg/g
Canthaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
trans-Lutein		0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	

Subcontracting partners:
1 (b) (4)

(b) (6)
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St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-004490-01

Received On: 23Jul2021
Reported On: 11Aug2021

(b) (6)

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(b) (4)

(b) (4), (b) (6)

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(b) (6)

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ANALYTICAL REPORT

AR-21-YI-004491-01

Received On: 23Jul2021
Reported On: 11Aug2021

(b) (4) Sample Code: 129-2021-07230039

Sample Registration Date: 23Jul2021

Client Sample Code: 2450 X 165 63601 #11

Condition Upon Receipt: acceptable, 20.9°C

Sample Description: BATCH 2 (7/20/2021) 21:06

Sample Reference: PX BIN: C

QD104 - Fiber, Dietary Insoluble	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)	0.2 %
Fiber, Dietary, Insoluble		0.2 %

QD148 - Moisture by Vacuum Oven	Reference	Accreditation	Completed	Sub
	AOAC 925.09	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %
Moisture and Volatiles - Vacuum Oven		0.5 %

QD230 - Fiber, Total Dietary	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Total Dietary Fiber	(b) (4)	0.2 %
Total Dietary Fiber		0.2 %

QD256 - Fiber, Dietary Soluble	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Fiber, Dietary, Soluble	(b) (4)	0.2 %
Fiber, Dietary, Soluble		0.2 %

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ANALYTICAL REPORT

AR-21-YI-004491-01

Received On: 23Jul2021
 Reported On: 11Aug2021

(b) (4) **Sample Code:** 129-2021-07230039 **Sample Registration Date:** 23Jul2021
Client Sample Code: 2450 X 165 63601 #11 **Condition Upon Receipt:** acceptable, 20.9°C
Sample Description: BATCH 2 (7/20/2021) 21:06 **Sample Reference:** PX BIN: C

Parameter	Reference	Accreditation	Completed	Sub
QQ167 - Water Activity	AOAC 978.18 mod.	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

Parameter	Reference	Accreditation	Completed
YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Method (HPLC) - ECT	ISO/IEC 17025:2017 A2LA 5492.01	11Aug2021

Parameter	Result	LOQ
Canthaxanthin	(b) (4)	0.03 µg/g
Canthaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
trans-Lutein		0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
Total Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	

Subcontracting partners:
 1 (b) (4)

(b) (6)

ANALYTICAL REPORT

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AR-21-YI-004491-01

Received On: 23Jul2021
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(b) (6)

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(b) (4)

(b) (4), (b) (6)

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(b) (6)

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ANALYTICAL REPORT

AR-21-YI-004492-01

Received On: 23Jul2021
Reported On: 11Aug2021

(b) (4) Sample Code: 129-2021-07230040

Sample Registration Date: 23Jul2021

Client Sample Code: 2450 X 165 63601 #12

Condition Upon Receipt: acceptable, 20.9°C

Sample Description: BATCH 2 (7/20/2021) 21:18

Sample Reference: PX BIN: C

QD104 - Fiber, Dietary Insoluble	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)	0.2 %
Fiber, Dietary, Insoluble	(b) (4)	0.2 %

QD148 - Moisture by Vacuum Oven	Reference	Accreditation	Completed	Sub
	AOAC 925.09	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %

QD230 - Fiber, Total Dietary	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Total Dietary Fiber	(b) (4)	0.2 %
Total Dietary Fiber	(b) (4)	0.2 %

QD256 - Fiber, Dietary Soluble	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Fiber, Dietary, Soluble	(b) (4)	0.2 %
Fiber, Dietary, Soluble	(b) (4)	0.2 %

(b) (6)

ANALYTICAL REPORT

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AR-21-YI-004492-01

Received On: 23Jul2021
Reported On: 11Aug2021

(b) (4) Sample Code: 129-2021-07230040	Sample Registration Date: 23Jul2021
Client Sample Code: 2450 X 165 63601 #12	Condition Upon Receipt: acceptable, 20.9°C
Sample Description: BATCH 2 (7/20/2021) 21:18	Sample Reference: PX BIN: C

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 09Aug2021	Sub 1
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Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference d (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 11Aug2021
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Parameter	Result	LOQ
Canthaxanthin	(b) (4)	0.03 µg/g
Canthaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
trans-Lutein		0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	

Subcontracting partners:

1 (b) (4)

Royal Canin

Client Code: YI0000062

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-21-YI-004492-01

Received On: 23Jul2021
Reported On: 11Aug2021

Respectfully Submitted,

(b) (6)

Department Manager

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-004529-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (4) Sample Code: 129-2021-07270014

Sample Registration Date: 27Jul2021

Client Sample Code: 2450 X 165 63636 #1

Condition Upon Receipt: acceptable, 22.5°C

Sample Description: Batch#3 (7/26/2021) 08:54

Sample Reference: PX BIN A

QD104 - Fiber, Dietary Insoluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 09Aug2021	Sub 1
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Parameter	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)	0.2 %
Fiber, Dietary, Insoluble	(b) (4)	0.2 %

QD148 - Moisture by Vacuum Oven	Reference AOAC 925.09	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 09Aug2021	Sub 1
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Parameter	Result	LOQ
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %

QD230 - Fiber, Total Dietary	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 09Aug2021	Sub 1
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Parameter	Result	LOQ
Total Dietary Fiber	(b) (4)	0.2 %
Total Dietary Fiber	(b) (4)	0.2 %

QD256 - Fiber, Dietary Soluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 09Aug2021	Sub 1
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Parameter	Result	LOQ
Fiber, Dietary, Soluble	(b) (4)	0.2 %
Fiber, Dietary, Soluble	(b) (4)	0.2 %

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-21-YI-004529-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (4) Sample Code: 129-2021-07270014

Sample Registration Date: 27Jul2021

Client Sample Code: 2450 X 165 63636 #1

Condition Upon Receipt: acceptable, 22.5°C

Sample Description: Batch#3 (7/26/2021) 08:54

Sample Reference: PX BIN A

QQ167 - Water Activity	Reference	Accreditation	Completed	Sub
	AOAC 978.18 mod.	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference	Accreditation	Completed
	(HPLC) - ECT	ISO/IEC 17025:2017 A2LA 5492.01	12Aug2021

Parameter	Result	LOQ
Canthaxanthin	(b) (4)	0.03 µg/g
Canthaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
trans-Lutein		0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	

Subcontracting partners:

1 (b) (4)

ANALYTICAL REPORT

(b) (6)
500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-21-YI-004529-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (6)

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(b) (4)

(b) (4)

Royal Canin

Client Code: YI0000062

ANALYTICAL REPORT

(b) (6)

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-21-YI-004530-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (4) Sample Code: 129-2021-07270015		Sample Registration Date: 27Jul2021		
Client Sample Code: 2450 X 165 63636 #2		Condition Upon Receipt: acceptable, 22.5°C		
Sample Description: Batch#3 (7/26/2021) 08:58		Sample Reference: PX BIN A		
QD104 - Fiber, Dietary Insoluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 12Aug2021	Sub 1

Parameter	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)	0.2 %
Fiber, Dietary, Insoluble	(b) (4)	0.2 %

QD148 - Moisture by Vacuum Oven	Reference AOAC 925.09	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 12Aug2021	Sub 1
Parameter	Result	LOQ		
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %		
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %		

QD230 - Fiber, Total Dietary	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 12Aug2021	Sub 1
Parameter	Result	LOQ		
Total Dietary Fiber	(b) (4)	0.2 %		
Total Dietary Fiber	(b) (4)	0.2 %		

QD256 - Fiber, Dietary Soluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 12Aug2021	Sub 1
Parameter	Result	LOQ		
Fiber, Dietary, Soluble	(b) (4)	0.2 %		
Fiber, Dietary, Soluble	(b) (4)	0.2 %		

(b) (6)
 500 Fountain Lakes Blvd, Suite 100
 St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-004530-01

Received On: 27Jul2021
 Reported On: 12Aug2021

(b) (4) Sample Code: 129-2021-07270015		Sample Registration Date: 27Jul2021		
Client Sample Code: 2450 X 165 63636 #2		Condition Upon Receipt: acceptable, 22.5°C		
Sample Description: Batch#3 (7/26/2021) 08:58		Sample Reference: PX BIN A		

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 12Aug2021	Sub 1
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Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference I (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 12Aug2021
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Parameter	Result	LOQ
Canthaxanthin	(b) (4)	0.03 µg/g
Canthaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
trans-Lutein		0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
Total Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	

Subcontracting partners:
 1 - (b) (4)

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-21-YI-004530-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (6)

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)
500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-004531-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (4) Sample Code: 129-2021-07270016	Sample Registration Date: 27Jul2021
Client Sample Code: 2450 X 165 63636 #3	Condition Upon Receipt: acceptable, 22.5°C
Sample Description: Batch#3 (7/26/2021) 10:44	Sample Reference: PX BIN A

QD104 - Fiber, Dietary Insoluble	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	12Aug2021	1

Parameter	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)	0.2 %
Fiber, Dietary, Insoluble	(b) (4)	0.2 %

QD148 - Moisture by Vacuum Oven	Reference	Accreditation	Completed	Sub
	AOAC 925.09	ISO/IEC 17025:2017 A2LA 2927.01	12Aug2021	1

Parameter	Result	LOQ
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %

QD230 - Fiber, Total Dietary	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	12Aug2021	1

Parameter	Result	LOQ
Total Dietary Fiber	(b) (4)	0.2 %
Total Dietary Fiber	(b) (4)	0.2 %

QD256 - Fiber, Dietary Soluble	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	12Aug2021	1

Parameter	Result	LOQ
Fiber, Dietary, Soluble	(b) (4)	0.2 %
Fiber, Dietary, Soluble	(b) (4)	0.2 %

(b) (6)
 500 Fountain Lakes Blvd, Suite 100
 St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-004531-01

Received On: 27Jul2021
 Reported On: 12Aug2021

(b) (4) Sample Code: 129-2021-07270016		Sample Registration Date: 27Jul2021		
Client Sample Code: 2450 X 165 63636 #3		Condition Upon Receipt: acceptable, 22.5°C		
Sample Description: Batch#3 (7/26/2021) 10:44		Sample Reference: PX BIN A		

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 12Aug2021	Sub 1
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Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference I hod (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 12Aug2021
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Parameter	Result	LOQ
Canthaxanthin	(b) (4)	0.03 µg/g
Canthaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
trans-Lutein		0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
Total Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	

Subcontracting partners:
 1 (b) (4)

(b) (6)
500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-004531-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (6)

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)
500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-004532-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (4) Sample Code: 129-2021-07270017		Sample Registration Date: 27Jul2021		
Client Sample Code: 2450 X 165 63636 #4		Condition Upon Receipt: acceptable, 22.5°C		
Sample Description: Batch#3 (7/26/2021) 11:30		Sample Reference: PX BIN A		
QD104 - Fiber, Dietary Insoluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 12Aug2021	Sub 1

Parameter	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)	0.2 %
Fiber, Dietary, Insoluble	(b) (4)	0.2 %

QD148 - Moisture by Vacuum Oven	Reference AOAC 925.09	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 12Aug2021	Sub 1
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Parameter	Result	LOQ
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %

QD230 - Fiber, Total Dietary	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 12Aug2021	Sub 1
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Parameter	Result	LOQ
Total Dietary Fiber	(b) (4)	0.2 %
Total Dietary Fiber	(b) (4)	0.2 %

QD256 - Fiber, Dietary Soluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 12Aug2021	Sub 1
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Parameter	Result	LOQ
Fiber, Dietary, Soluble	(b) (4)	0.2 %
Fiber, Dietary, Soluble	(b) (4)	0.2 %

(b) (6)
500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-004532-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (4) Sample Code: 129-2021-07270017		Sample Registration Date: 27Jul2021		
Client Sample Code: 2450 X 165 63636 #4		Condition Upon Receipt: acceptable, 22.5°C		
Sample Description: Batch#3 (7/26/2021) 11:30		Sample Reference: PX BIN A		

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 12Aug2021	Sub 1
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Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference I od (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 12Aug2021
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Parameter	Result	LOQ
Canthaxanthin	(b) (4)	0.03 µg/g
Canthaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
trans-Lutein		0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	

Subcontracting partners:
1 (b) (4)

(b) (6)
500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-004532-01

Received On: 27Jul2021
Reported On: 12Aug2021

Respectfully Submitted,

(b) (6)

Department Manager

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-004533-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (4) Sample Code: 129-2021-07270018

Sample Registration Date: 27Jul2021

Client Sample Code: 2450 X 165 63636 #5

Condition Upon Receipt: acceptable, 22.5°C

Sample Description: Batch#3 (7/26/2021) 11:39

Sample Reference: PX BIN A

QD104 - Fiber, Dietary Insoluble	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)	0.2 %
Fiber, Dietary, Insoluble		0.2 %

QD148 - Moisture by Vacuum Oven	Reference	Accreditation	Completed	Sub
	AOAC 925.09	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %
Moisture and Volatiles - Vacuum Oven		0.5 %

QD230 - Fiber, Total Dietary	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Total Dietary Fiber	(b) (4)	0.2 %
Total Dietary Fiber		0.2 %

QD256 - Fiber, Dietary Soluble	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Fiber, Dietary, Soluble	(b) (4)	0.2 %
Fiber, Dietary, Soluble		0.2 %

(b) (6)
500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-004533-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (4) Sample Code: 129-2021-07270018	Sample Registration Date: 27Jul2021
Client Sample Code: 2450 X 165 63636 #5	Condition Upon Receipt: acceptable, 22.5°C
Sample Description: Batch#3 (7/26/2021) 11:39	Sample Reference: PX BIN A

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 09Aug2021	Sub 1
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Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference d (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 12Aug2021
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Parameter	Result	LOQ
Canthaxanthin	(b) (4)	0.03 µg/g
Canthaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
trans-Lutein		0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	

Subcontracting partners:
1 - (b) (4)

(b) (6)
500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-004533-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (6)

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(b) (4)

(b) (4), (b) (6)

Royal Canin

ANALYTICAL REPORT

(b) (6)
500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-21-YI-004534-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (4) Sample Code: 129-2021-07270019		Sample Registration Date: 27Jul2021		
Client Sample Code: 2450 X 165 63636 #6		Condition Upon Receipt: acceptable, 22.5°C		
Sample Description: Batch#3 (7/26/2021) 11:40		Sample Reference: PX BIN A		
QD104 - Fiber, Dietary Insoluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 09Aug2021	Sub 1

Parameter	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)	0.2 %
Fiber, Dietary, Insoluble	(b) (4)	0.2 %

QD148 - Moisture by Vacuum Oven	Reference AOAC 925.09	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 09Aug2021	Sub 1
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Parameter	Result	LOQ
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %

QD230 - Fiber, Total Dietary	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 09Aug2021	Sub 1
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Parameter	Result	LOQ
Total Dietary Fiber	(b) (4)	0.2 %
Total Dietary Fiber	(b) (4)	0.2 %

QD256 - Fiber, Dietary Soluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 09Aug2021	Sub 1
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Parameter	Result	LOQ
Fiber, Dietary, Soluble	(b) (4)	0.2 %
Fiber, Dietary, Soluble	(b) (4)	0.2 %

(b) (6)
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ANALYTICAL REPORT

AR-21-YI-004534-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (4) Sample Code: 129-2021-07270019	Sample Registration Date: 27Jul2021
Client Sample Code: 2450 X 165 63636 #6	Condition Upon Receipt: acceptable, 22.5°C
Sample Description: Batch#3 (7/26/2021) 11:40	Sample Reference: PX BIN A

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 09Aug2021	Sub 1
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Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference d (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 12Aug2021
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Parameter	Result	LOQ
Canthaxanthin	(b) (4)	0.03 µg/g
Canthaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
trans-Lutein		0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
Total Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	

Subcontracting partners:
1 (b) (4)

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
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AR-21-YI-004534-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (6)

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)

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ANALYTICAL REPORT

AR-21-YI-004535-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (4) Sample Code: 129-2021-07270020	Sample Registration Date: 27Jul2021
Client Sample Code: 2450 X 165 63636 #7	Condition Upon Receipt: acceptable, 22.5°C
Sample Description: Batch#3 (7/26/2021) 11:47	Sample Reference: PX BIN A

QD104 - Fiber, Dietary Insoluble	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)	0.2 %
Fiber, Dietary, Insoluble		0.2 %

QD148 - Moisture by Vacuum Oven	Reference	Accreditation	Completed	Sub
	AOAC 925.09	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %
Moisture and Volatiles - Vacuum Oven		0.5 %

QD230 - Fiber, Total Dietary	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Total Dietary Fiber	(b) (4)	0.2 %
Total Dietary Fiber		0.2 %

QD256 - Fiber, Dietary Soluble	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	09Aug2021	1

Parameter	Result	LOQ
Fiber, Dietary, Soluble	(b) (4)	0.2 %
Fiber, Dietary, Soluble		0.2 %

(b) (6)
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ANALYTICAL REPORT

AR-21-YI-004535-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (4) Sample Code: 129-2021-07270020		Sample Registration Date: 27Jul2021		
Client Sample Code: 2450 X 165 63636 #7		Condition Upon Receipt: acceptable, 22.5°C		
Sample Description: Batch#3 (7/26/2021) 11:47		Sample Reference: PX BIN A		

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 09Aug2021	Sub 1
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Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference In hod (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 12Aug2021
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Parameter	Result	LOQ
Canthaxanthin	(b) (4)	0.03 µg/g
Canthaxanthin	(b) (4)	0.03 µg/g
Astaxanthin	(b) (4)	0.03 µg/g
Astaxanthin	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

Subcontracting partners:
1 - (b) (4)

(b) (6)

ANALYTICAL REPORT

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AR-21-YI-004535-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (6)

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(b) (4)

(b) (4), (b) (6)

Royal Canin

2

(b) (6)

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ANALYTICAL REPORT

AR-21-YI-004536-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (4) Sample Code: 129-2021-07270021

Sample Registration Date: 27Jul2021

Client Sample Code: 2450 X 165 63636 #8

Condition Upon Receipt: acceptable, 22.5°C

Sample Description: Batch#3 (7/26/2021) 12:12

Sample Reference: PX BIN A

QD104 - Fiber, Dietary Insoluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 12Aug2021	Sub 1
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Parameter	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)	0.2 %
Fiber, Dietary, Insoluble		0.2 %

QD148 - Moisture by Vacuum Oven	Reference AOAC 925.09	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 12Aug2021	Sub 1
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Parameter	Result	LOQ
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %
Moisture and Volatiles - Vacuum Oven		0.5 %

QD230 - Fiber, Total Dietary	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 12Aug2021	Sub 1
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Parameter	Result	LOQ
Total Dietary Fiber	(b) (4)	0.2 %
Total Dietary Fiber		0.2 %

QD256 - Fiber, Dietary Soluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 12Aug2021	Sub 1
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Parameter	Result	LOQ
Fiber, Dietary, Soluble	(b) (4)	0.2 %
Fiber, Dietary, Soluble		0.2 %

(b) (6)
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ANALYTICAL REPORT

AR-21-YI-004536-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (4) Sample Code: 129-2021-07270021		Sample Registration Date: 27Jul2021		
Client Sample Code: 2450 X 165 63636 #8		Condition Upon Receipt: acceptable, 22.5°C		
Sample Description: Batch#3 (7/26/2021) 12:12		Sample Reference: PX BIN A		

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 12Aug2021	Sub 1
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Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference od (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 12Aug2021
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Parameter	Result	LOQ
Canthaxanthin	(b) (4)	0.03 µg/g
Canthaxanthin	(b) (4)	0.03 µg/g
Astaxanthin	(b) (4)	0.03 µg/g
Astaxanthin	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

Subcontracting partners:
1 (b) (4)

(b) (6)
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ANALYTICAL REPORT

AR-21-YI-004536-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (6)

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(b) (4)

(b) (4)

Royal Canin

(b) (6)

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ANALYTICAL REPORT

AR-21-YI-004537-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (4) Sample Code: 129-2021-07270022	Sample Registration Date: 27Jul2021
Client Sample Code: 2450 X 165 63636 #9	Condition Upon Receipt: acceptable, 22.5°C
Sample Description: Batch#3 (7/26/2021) 13:00	Sample Reference: PX BIN A

QD104 - Fiber, Dietary Insoluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 11Aug2021	Sub 1
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Parameter	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)	0.2 %
Fiber, Dietary, Insoluble		0.2 %

QD148 - Moisture by Vacuum Oven	Reference AOAC 925.09	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 11Aug2021	Sub 1
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Parameter	Result	LOQ
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %
Moisture and Volatiles - Vacuum Oven		0.5 %

QD230 - Fiber, Total Dietary	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 11Aug2021	Sub 1
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Parameter	Result	LOQ
Total Dietary Fiber	(b) (4)	0.2 %
Total Dietary Fiber		0.2 %

QD256 - Fiber, Dietary Soluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 11Aug2021	Sub 1
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Parameter	Result	LOQ
Fiber, Dietary, Soluble	(b) (4)	0.2 %
Fiber, Dietary, Soluble		0.2 %

ANALYTICAL REPORT

(b) (6)
500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-21-YI-004537-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (4) Sample Code: 129-2021-07270022	Sample Registration Date: 27Jul2021
Client Sample Code: 2450 X 165 63636 #9	Condition Upon Receipt: acceptable, 22.5°C
Sample Description: Batch#3 (7/26/2021) 13:00	Sample Reference: PX BIN A

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 11Aug2021	Sub 1
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Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference od (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 12Aug2021
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Parameter	Result	LOQ
Canthaxanthin	(b) (4)	0.03 µg/g
Canthaxanthin	(b) (4)	0.03 µg/g
Astaxanthin	(b) (4)	0.03 µg/g
Astaxanthin	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

Subcontracting partners:
1 (b) (4)

ANALYTICAL REPORT

(b) (6)
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AR-21-YI-004537-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (6)

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)

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ANALYTICAL REPORT

AR-21-YI-004538-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (4) Sample Code: 129-2021-07270023

Sample Registration Date: 27Jul2021

Client Sample Code: 2450 X 165 63636 #10

Condition Upon Receipt: acceptable, 22.5°C

Sample Description: Batch#3 (7/26/2021) 13:15

Sample Reference: PX BIN A

QD104 - Fiber, Dietary Insoluble	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	11Aug2021	1

Parameter	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)	0.2 %
Fiber, Dietary, Insoluble		0.2 %

QD148 - Moisture by Vacuum Oven	Reference	Accreditation	Completed	Sub
	AOAC 925.09	ISO/IEC 17025:2017 A2LA 2927.01	11Aug2021	1

Parameter	Result	LOQ
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %
Moisture and Volatiles - Vacuum Oven		0.5 %

QD230 - Fiber, Total Dietary	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	11Aug2021	1

Parameter	Result	LOQ
Total Dietary Fiber	(b) (4)	0.2 %
Total Dietary Fiber		0.2 %

QD256 - Fiber, Dietary Soluble	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	11Aug2021	1

Parameter	Result	LOQ
Fiber, Dietary, Soluble	(b) (4)	0.2 %
Fiber, Dietary, Soluble		0.2 %

(b) (6)
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ANALYTICAL REPORT

AR-21-YI-004538-01

Received On: 27Jul2021
 Reported On: 12Aug2021

(b) (4) Sample Code: 129-2021-07270023		Sample Registration Date: 27Jul2021		
Client Sample Code: 2450 X 165 63636 #10		Condition Upon Receipt: acceptable, 22.5°C		
Sample Description: Batch#3 (7/26/2021) 13:15		Sample Reference: PX BIN A		

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 11Aug2021	Sub 1
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Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference I thod (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 12Aug2021
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Parameter	Result	LOQ
Canthaxanthin	(b) (4)	0.03 µg/g
Canthaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
trans-Lutein		0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	

Subcontracting partners:
 1 (b) (4)

(b) (6)
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St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-004538-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (6)

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(b) (6)

(b) (4)

(b) (6)

Pat Keller
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St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-004539-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (4) Sample Code: 129-2021-07270024

Sample Registration Date: 27Jul2021

Client Sample Code: 2450 X 165 63636 #11

Condition Upon Receipt: acceptable, 22.5°C

Sample Description: Batch#3 (7/26/2021) 15:45

Sample Reference: PX BIN A

QD104 - Fiber, Dietary Insoluble	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	11Aug2021	1

Parameter	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)	0.2 %
Fiber, Dietary, Insoluble		0.2 %

QD148 - Moisture by Vacuum Oven	Reference	Accreditation	Completed	Sub
	AOAC 925.09	ISO/IEC 17025:2017 A2LA 2927.01	11Aug2021	1

Parameter	Result	LOQ
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %
Moisture and Volatiles - Vacuum Oven		0.5 %

QD230 - Fiber, Total Dietary	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	11Aug2021	1

Parameter	Result	LOQ
Total Dietary Fiber	(b) (4)	0.2 %
Total Dietary Fiber		0.2 %

QD256 - Fiber, Dietary Soluble	Reference	Accreditation	Completed	Sub
	AOAC 991.43	ISO/IEC 17025:2017 A2LA 2927.01	11Aug2021	1

Parameter	Result	LOQ
Fiber, Dietary, Soluble	(b) (4)	0.2 %
Fiber, Dietary, Soluble		0.2 %

(b) (6)
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ANALYTICAL REPORT

AR-21-YI-004539-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (4) Sample Code: 129-2021-07270024	Sample Registration Date: 27Jul2021
Client Sample Code: 2450 X 165 63636 #11	Condition Upon Receipt: acceptable, 22.5°C
Sample Description: Batch#3 (7/26/2021) 15:45	Sample Reference: PX BIN A

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 11Aug2021	Sub 1
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Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C		0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference d (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 12Aug2021
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Parameter	Result	LOQ
Canthaxanthin	(b) (4)	0.03 µg/g
Canthaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
trans-Lutein		0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	

Subcontracting partners:
1 - (b) (4)

(b) (6)
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St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-004539-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (6)

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(b) (4)

(b) (4), (b) (6)

Royal Canin

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(b) (6)
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St. Charles, MO 63301

ANALYTICAL REPORT

AR-21-YI-004540-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (4) Sample Code: 129-2021-07270025		Sample Registration Date: 27Jul2021		
Client Sample Code: 2450 X 165 63636 #12		Condition Upon Receipt: acceptable, 22.5°C		
Sample Description: Batch#3 (7/26/2021) 15:57		Sample Reference: PX BIN A		
QD104 - Fiber, Dietary Insoluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 11Aug2021	Sub 1

Parameter	Result	LOQ
Fiber, Dietary, Insoluble	(b) (4)	0.2 %
Fiber, Dietary, Insoluble		0.2 %

QD148 - Moisture by Vacuum Oven	Reference AOAC 925.09	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 11Aug2021	Sub 1
Parameter	Result	LOQ		
Moisture and Volatiles - Vacuum Oven	(b) (4)	0.5 %		
Moisture and Volatiles - Vacuum Oven		0.5 %		

QD230 - Fiber, Total Dietary	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 11Aug2021	Sub 1
Parameter	Result	LOQ		
Total Dietary Fiber	(b) (4)	0.2 %		
Total Dietary Fiber		0.2 %		

QD256 - Fiber, Dietary Soluble	Reference AOAC 991.43	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 11Aug2021	Sub 1
Parameter	Result	LOQ		
Fiber, Dietary, Soluble	(b) (4)	0.2 %		
Fiber, Dietary, Soluble		0.2 %		

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ANALYTICAL REPORT

AR-21-YI-004540-01

Received On: 27Jul2021
Reported On: 12Aug2021

(b) (4) Sample Code: 129-2021-07270025		Sample Registration Date: 27Jul2021		
Client Sample Code: 2450 X 165 63636 #12		Condition Upon Receipt: acceptable, 22.5°C		
Sample Description: Batch#3 (7/26/2021) 15:57		Sample Reference: PX BIN A		

QQ167 - Water Activity	Reference AOAC 978.18 mod.	Accreditation ISO/IEC 17025:2017 A2LA 2927.01	Completed 11Aug2021	Sub 1
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Parameter	Result	LOQ
Water Activity at 25°C	(b) (4)	0.03 No unit
Water Activity at 25°C	(b) (4)	0.03 No unit

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference In hod (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 12Aug2021
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Parameter	Result	LOQ
Canthaxanthin	(b) (4)	0.03 µg/g
Canthaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
Astaxanthin		0.03 µg/g
trans-Lutein		0.03 µg/g
trans-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
cis-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
Total Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	

Subcontracting partners:
1- (b) (4)

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(b) (6)
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AR-21-YI-004540-01

Received On: 27Jul2021
Reported On: 12Aug2021

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(b) (6)

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ANALYTICAL REPORT

AR-24-YI-002384-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4)	Sample Code: 129-2024-04150049	Sample Registration Date: 15Apr2024
	Client Sample Code: 411A1RSD03-3 1	Condition Upon Receipt: acceptable, 24.5°C
	Sample Description: Finished Wet Product Lot 1 - Homogeneity Can 1	Sample Reference: RCVD FELINE RENAL SUPPORT Lot 1 ORT Lot 1 Can 1

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference ethod (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 26Apr2024
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Parameter		LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

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Client Code: YI0000062

PO#: LEO0US240041-01

(b) (6)

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AR-24-YI-002384-01

Received On: 15Apr2024

Reported On: 26Apr2024



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ANALYTICAL REPORT

AR-24-YI-002385-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4)	Sample Code: 129-2024-04150050	Sample Registration Date: 15Apr2024
	Client Sample Code: 411A1RSD03-3 2	Condition Upon Receipt: acceptable, 24.5°C
	Sample Description: Finished Wet Product Lot 1 - Homogeneity Can 2	Sample Reference: RCVD FELINE RENAL SUPPORT Lot 1

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference thod (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 26Apr2024
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Parameter	Reference	LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

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Client Code: YI0000062

PO#: LEO0US240041-01

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AR-24-YI-002385-01

Received On: 15Apr2024

Reported On: 26Apr2024



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ANALYTICAL REPORT

AR-24-YI-002386-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4) Sample Code:	129-2024-04150051	Sample Registration Date:	15Apr2024
Client Sample Code:	411A1RSD03-3 3	Condition Upon Receipt:	acceptable, 24.5°C
Sample Description:	Finished Wet Product Lot 1 - Homogeneity Can 3	Sample Reference:	RCVD FELINE RENAL SUPPORT Lot 1

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference ethod (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 26Apr2024
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Parameter		LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

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Client Code: YI0000062

PO#: LEO0US240041-01

(b) (6)

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AR-24-YI-002386-01

Received On: 15Apr2024

Reported On: 26Apr2024



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ANALYTICAL REPORT

AR-24-YI-002387-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4) Sample Code:	129-2024-04150052	Sample Registration Date:	15Apr2024
Client Sample Code:	411A1RSD03-3 4	Condition Upon Receipt:	acceptable, 24.5°C
Sample Description:	Finished Wet Product Lot 1 - Homogeneity Can 4	Sample Reference:	RCVD FELINE RENAL SUPPORT Lot 1

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference ethod (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 26Apr2024
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Parameter	(b) (4)	LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

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Client Code: YI0000062

PO#: LEO0US240041-01

(b) (6)

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AR-24-YI-002387-01

Received On: 15Apr2024

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ANALYTICAL REPORT

AR-24-YI-002388-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4) Sample Code:	129-2024-04150053	Sample Registration Date:	15Apr2024
Client Sample Code:	411A1RSD03-3 5	Condition Upon Receipt:	acceptable, 24.5°C
Sample Description:	Finished Wet Product Lot 1 - Homogeneity Can 5	Sample Reference:	RCVD FELINE RENAL SUPPORT Lot 1

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference ethod (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 26Apr2024
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Parameter	Reference	LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

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Client Code: YI0000062

PO#: LEO0US240041-01

(b) (6)

ANALYTICAL REPORT

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AR-24-YI-002388-01

Received On: 15Apr2024

Reported On: 26Apr2024



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ANALYTICAL REPORT

AR-24-YI-002389-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4) Sample Code:	129-2024-04150054	Sample Registration Date:	15Apr2024
Client Sample Code:	411A1RSD03-3 6	Condition Upon Receipt:	acceptable, 24.5°C
Sample Description:	Finished Wet Product Lot 1 - Homogeneity Can 6	Sample Reference:	RCVD F 6ELINE RENAL SUPPORT Lot 1

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference thod (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 26Apr2024
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Parameter		LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

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Client Code: YI0000062

PO#: LEO0US240041-01

(b) (6)

ANALYTICAL REPORT

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AR-24-YI-002389-01

Received On: 15Apr2024

Reported On: 26Apr2024



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ANALYTICAL REPORT

AR-24-YI-002390-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4) Sample Code:	129-2024-04150055	Sample Registration Date:	15Apr2024
Client Sample Code:	411A1RSD03-3 7	Condition Upon Receipt:	acceptable, 24.5°C
Sample Description:	Finished Wet Product Lot 1 - Homogeneity Can 7	Sample Reference:	RCVD FELINE RENAL SUPPORT Lot 1

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference	Accreditation	Completed
	d (HPLC) - ECT	ISO/IEC 17025:2017 A2LA 5492.01	26Apr2024

Parameter		LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein		0.03 µg/g
trans-Lutein		0.03 µg/g
trans-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
Total Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	

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Client Code: YI0000062

PO#: LEO0US240041-01

(b) (6)

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AR-24-YI-002390-01

Received On: 15Apr2024

Reported On: 26Apr2024



(b) (6)

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(b) (4)

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ANALYTICAL REPORT

AR-24-YI-002391-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4) Sample Code:	129-2024-04150056	Sample Registration Date:	15Apr2024
Client Sample Code:	411A1RSD03-3 8	Condition Upon Receipt:	acceptable, 24.5°C
Sample Description:	Finished Wet Product Lot 1 - Homogeneity Can 8	Sample Reference:	RCVD FELINE RENAL SUPPORT Lot 1

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference ethod (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 26Apr2024
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Parameter		LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

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(b) (6)

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ANALYTICAL REPORT

AR-24-YI-002391-01

Client Code: YI0000062

PO#: LEO0US240041-01

Received On: 15Apr2024

Reported On: 26Apr2024



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(b) (4)

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ANALYTICAL REPORT

AR-24-YI-002392-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4) Sample Code:	129-2024-04150057	Sample Registration Date:	15Apr2024
Client Sample Code:	411A1RSD03-3 9	Condition Upon Receipt:	acceptable, 24.5°C
Sample Description:	Finished Wet Product Lot 1 - Homogeneity Can 9	Sample Reference:	RCVD FELINE RENAL SUPPORT Lot 1

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference ethod (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 26Apr2024
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Parameter	Reference	LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

Royal Canin

Client Code: YI0000062

PO#: LEO0US240041-01

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-24-YI-002392-01

Received On: 15Apr2024

Reported On: 26Apr2024

Respectfully Submitted,



(b) (6)

Department Manager Department Manager

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)
500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

ANALYTICAL REPORT

AR-24-YI-002393-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4) Sample Code:	129-2024-04150058	Sample Registration Date:	15Apr2024
Client Sample Code:	411A1RSD03-3 10	Condition Upon Receipt:	acceptable, 24.5°C
Sample Description:	Finished Wet Product Lot 1 - Homogeneity Can 10	Sample Reference:	RCVD FELINE RENAL SUPPORT Lot 1

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference ethod (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 26Apr2024
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Parameter	Reference	LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

Royal Canin

Client Code: YI0000062

PO#: LEO0US240041-01

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-24-YI-002393-01

Received On: 15Apr2024

Reported On: 26Apr2024



(b) (6)

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)
500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

ANALYTICAL REPORT

AR-24-YI-002394-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4) Sample Code:	129-2024-04150059	Sample Registration Date:	15Apr2024
Client Sample Code:	411A1RSD03-4 1	Condition Upon Receipt:	acceptable, 24.5°C
Sample Description:	Finished Wet Product Lot 2 - Homogeneity - Can 1	Sample Reference:	RCVD FELINE RENAL SUPPORT Lot 2

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference ethod (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 26Apr2024
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Parameter		LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

Royal Canin

Client Code: YI0000062

PO#: LEO0US240041-01

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-24-YI-002394-01

Received On: 15Apr2024

Reported On: 26Apr2024

Respectfully Submitted,



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Department Manager Department Manager

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)

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St. Charles, MO 63301

ANALYTICAL REPORT

AR-24-YI-002395-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4) Sample Code:	129-2024-04150060	Sample Registration Date:	15Apr2024
Client Sample Code:	411A1RSD03-4 2	Condition Upon Receipt:	acceptable, 24.5°C
Sample Description:	Finished Wet Product Lot 2 - Homogeneity - Can 2	Sample Reference:	RCVD FELINE RENAL SUPPORT Lot 2

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference thod (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 26Apr2024
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Parameter		LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

Royal Canin

Client Code: YI0000062

PO#: LEO0US240041-01

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-24-YI-002395-01

Received On: 15Apr2024

Reported On: 26Apr2024



(b) (4)

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)

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St. Charles, MO 63301

ANALYTICAL REPORT

AR-24-YI-002396-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4) Sample Code:	129-2024-04150061	Sample Registration Date:	15Apr2024
Client Sample Code:	411A1RSD03-4 3	Condition Upon Receipt:	acceptable, 24.5°C
Sample Description:	Finished Wet Product Lot 2 - Homogeneity - Can 3	Sample Reference:	RCVD FELINE RENAL SUPPORT Lot 2

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference	Accreditation	Completed
	thod (HPLC) - ECT	ISO/IEC 17025:2017 A2LA 5492.01	26Apr2024

Parameter		LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

Royal Canin

(b) (6)

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St. Charles, MO 63301

ANALYTICAL REPORT

AR-24-YI-002396-01

Client Code: YI0000062

PO#: LEO0US240041-01

Received On: 15Apr2024

Reported On: 26Apr2024



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(b) (4)

(b) (4), (b) (6)

Royal Canin

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St. Charles, MO 63301

ANALYTICAL REPORT

AR-24-YI-002397-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4) Sample Code:	129-2024-04150062	Sample Registration Date:	15Apr2024
Client Sample Code:	411A1RSD03-4 4	Condition Upon Receipt:	acceptable, 24.5°C
Sample Description:	Finished Wet Product Lot 2 - Homogeneity - Can 4	Sample Reference:	RCVD FELINE RENAL SUPPORT Lot 2

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference ethod (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 26Apr2024
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Parameter		LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

Royal Canin

Client Code: YI0000062

PO#: LEO0US240041-01

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-24-YI-002397-01

Received On: 15Apr2024

Reported On: 26Apr2024

Respectfully Submitted,



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Department Manager Department Manager

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(b) (4)

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St. Charles, MO 63301

ANALYTICAL REPORT

AR-24-YI-002398-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4) Sample Code:	129-2024-04150063	Sample Registration Date:	15Apr2024
Client Sample Code:	411A1RSD03-4 5	Condition Upon Receipt:	acceptable, 24.5°C
Sample Description:	Finished Wet Product Lot 2 - Homogeneity - Can 5	Sample Reference:	RCVD FELINE RENAL SUPPORT Lot 2

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference ethod (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 26Apr2024
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Parameter		LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

Royal Canin

Client Code: YI0000062

PO#: LEO0US240041-01

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-24-YI-002398-01

Received On: 15Apr2024

Reported On: 26Apr2024

Respectfully Submitted,



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(b) (4)

(b) (4), (b) (6)

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(b) (6)

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St. Charles, MO 63301

ANALYTICAL REPORT

AR-24-YI-002399-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4) Sample Code:	129-2024-04150064	Sample Registration Date:	15Apr2024
Client Sample Code:	411A1RSD03-4 6	Condition Upon Receipt:	acceptable, 24.5°C
Sample Description:	Finished Wet Product Lot 2 - Homogeneity - Can 6	Sample Reference:	RCVD FELINE RENAL SUPPORT Lot 2

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference	Accreditation	Completed
	hod (HPLC) - ECT	ISO/IEC 17025:2017 A2LA 5492.01	26Apr2024

Parameter		LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

Royal Canin

Client Code: YI0000062

PO#: LEO0US240041-01

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-24-YI-002399-01

Received On: 15Apr2024

Reported On: 26Apr2024

Respectfully Submitted,



(b) (6)

Department Manager Department Manager

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(b) (4)

(b) (4)

Royal Canin

2
1

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-24-YI-002400-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4)	Sample Code: 129-2024-04150065	Sample Registration Date: 15Apr2024
	Client Sample Code: 411A1RSD03-4 7	Condition Upon Receipt: acceptable, 24.5°C
	Sample Description: Finished Wet Product Lot 2 - Homogeneity - Can 7	Sample Reference: RCVD FELINE RENAL SUPPORT Lot 2

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference thod (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 26Apr2024
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Parameter		LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

Royal Canin

Client Code: YI0000062

PO#: LEO0US240041-01

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-24-YI-002400-01

Received On: 15Apr2024

Reported On: 26Apr2024

Respectfully Submitted,



(b) (6)

Department Manager Department Manager

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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)

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St. Charles, MO 63301

ANALYTICAL REPORT

AR-24-YI-002401-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4) Sample Code:	129-2024-04150066	Sample Registration Date:	15Apr2024
Client Sample Code:	411A1RSD03-4 8	Condition Upon Receipt:	acceptable, 24.5°C
Sample Description:	Finished Wet Product Lot 2 - Homogeneity Can 8	Sample Reference:	RCVD FELINE RENAL SUPPORT Lot 2

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference	Accreditation	Completed
	thod (HPLC) - ECT	ISO/IEC 17025:2017 A2LA 5492.01	26Apr2024

Parameter		LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

Royal Canin

Client Code: YI0000062

PO#: LEO0US240041-01

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-24-YI-002401-01

Received On: 15Apr2024

Reported On: 26Apr2024



(b) (6)

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(b) (4)

(b) (4), (b) (6)

Royal Canin

2

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-24-YI-002402-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4) Sample Code:	129-2024-04150067	Sample Registration Date:	15Apr2024
Client Sample Code:	411A1RSD03-4 9	Condition Upon Receipt:	acceptable, 24.5°C
Sample Description:	Finished Wet Product Lot 2 - Homogeneity Can 9	Sample Reference:	RCVD FELINE RENAL SUPPORT Lot 2

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference	Accreditation	Completed
	od (HPLC) - ECT	ISO/IEC 17025:2017 A2LA 5492.01	26Apr2024

Parameter		LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

Royal Canin

(b) (6)

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St. Charles, MO 63301

ANALYTICAL REPORT

AR-24-YI-002402-01

Client Code: YI0000062

PO#: LEO0US240041-01

Received On: 15Apr2024

Reported On: 26Apr2024



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(b) (4)

(b) (4), (b) (6)

Royal Canin

(b) (6)

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St. Charles, MO 63301

ANALYTICAL REPORT

AR-24-YI-002403-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4)	Sample Code: 129-2024-04150068	Sample Registration Date: 15Apr2024
	Client Sample Code: 411A1RSD03-4 10	Condition Upon Receipt: acceptable, 24.5°C
	Sample Description: Finished Wet Product Lot 2 - Homogeneity Can 10	Sample Reference: RCVD FELINE RENAL SUPPORT Lot 2

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference hod (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 26Apr2024
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Parameter		LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

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Client Code: YI0000062

PO#: LEO0US240041-01

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AR-24-YI-002403-01

Received On: 15Apr2024

Reported On: 26Apr2024

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(b) (4)

(b) (4), (b) (6)

Royal Canin

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St. Charles, MO 63301

ANALYTICAL REPORT

AR-24-YI-002404-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4)	Sample Code: 129-2024-04150069	Sample Registration Date: 15Apr2024
	Client Sample Code: 411A1RSD03-5 1	Condition Upon Receipt: acceptable, 24.5°C
	Sample Description: Finished Wet Product Lot 3 - Homogeneity Can 1	Sample Reference: RCVD FELINE RENAL SUPPORT Lot 3

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference od (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 26Apr2024
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Parameter		LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

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Client Code: YI0000062

PO#: LEO0US240041-01

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AR-24-YI-002404-01

Received On: 15Apr2024

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(b) (4)

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ANALYTICAL REPORT

AR-24-YI-002405-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4)	Sample Code: 129-2024-04150070	Sample Registration Date: 15Apr2024
	Client Sample Code: 411A1RSD03-5 2	Condition Upon Receipt: acceptable, 24.5°C
	Sample Description: Finished Wet Product Lot 3 - Homogeneity Can 2	Sample Reference: RCVD FELINE RENAL SUPPORT Lot 3

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference od (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 26Apr2024
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Parameter		LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein		0.03 µg/g
trans-Lutein		0.03 µg/g
trans-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
Total Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	

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Client Code: YI0000062

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ANALYTICAL REPORT

AR-24-YI-002406-01

Received On: 15Apr2024

Reported On: 26Apr2024

(b) (4) Sample Code:	129-2024-04150071	Sample Registration Date:	15Apr2024
Client Sample Code:	411A1RSD03-5 3	Condition Upon Receipt:	acceptable, 24.5°C
Sample Description:	Finished Wet Product Lot 3 - Homogeneity Can 3	Sample Reference:	RCVD FELINE RENAL SUPPORT Lot 3

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference ethod (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 26Apr2024
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Parameter		LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

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Client Code: YI0000062

PO#: LEO0US240041-01

(b) (6)

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ANALYTICAL REPORT

AR-24-YI-002407-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4) Sample Code:	129-2024-04150072	Sample Registration Date:	15Apr2024
Client Sample Code:	411A1RSD03-5 4	Condition Upon Receipt:	acceptable, 24.5°C
Sample Description:	Finished Wet Product Lot 3 - Homogeneity Can 4	Sample Reference:	RCVD FELINE RENAL SUPPORT Lot 3

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference	Accreditation	Completed
	thod (HPLC) - ECT	ISO/IEC 17025:2017 A2LA 5492.01	26Apr2024

Parameter		LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

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Client Code: YI0000062

PO#: LEO0US240041-01

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Received On: 15Apr2024

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ANALYTICAL REPORT

AR-24-YI-002408-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4)

Sample Code:	129-2024-04150073	Sample Registration Date:	15Apr2024
Client Sample Code:	411A1RSD03-5 5	Condition Upon Receipt:	acceptable, 24.5°C
Sample Description:	Finished Wet Product Lot 3 - Homogeneity Can 5	Sample Reference:	RCVD FELINE RENAL SUPPORT Lot 3

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference ethod (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 26Apr2024
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Parameter		LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

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Client Code: YI0000062

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AR-24-YI-002408-01

Received On: 15Apr2024

Reported On: 26Apr2024



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(b) (4)

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ANALYTICAL REPORT

AR-24-YI-002409-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4)	Sample Code: 129-2024-04150074	Sample Registration Date: 15Apr2024
	Client Sample Code: 411A1RSD03-5 6	Condition Upon Receipt: acceptable, 24.5°C
	Sample Description: Finished Wet Product Lot 3 - Homogeneity Can 6	Sample Reference: RCVD FELINE RENAL SUPPORT Lot 3

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference thod (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 26Apr2024
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Parameter	Reference	LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein		0.03 µg/g
trans-Lutein		0.03 µg/g
trans-Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
Total Lutein		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
cis-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
trans-Zeaxanthin		0.03 µg/g
Total Zeaxanthin	0.03 µg/g	
Total Zeaxanthin	0.03 µg/g	

Royal Canin

Client Code: YI0000062

PO#: LEO0US240041-01

(b) (6)

ANALYTICAL REPORT

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AR-24-YI-002409-01

Received On: 15Apr2024

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ANALYTICAL REPORT

AR-24-YI-002410-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4) Sample Code:	129-2024-04150075	Sample Registration Date:	15Apr2024
Client Sample Code:	411A1RSD03-5 7	Condition Upon Receipt:	acceptable, 24.5°C
Sample Description:	Finished Wet Product Lot 3 - Homogeneity Can 7	Sample Reference:	RCVD FELINE RENAL SUPPORT Lot 3

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference	Accreditation	Completed
	thod (HPLC) - ECT	ISO/IEC 17025:2017 A2LA 5492.01	26Apr2024

Parameter		LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

Royal Canin

Client Code: YI0000062

PO#: LEO0US240041-01

(b) (6)

ANALYTICAL REPORT

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AR-24-YI-002410-01

Received On: 15Apr2024

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(b) (4)

(b) (4), (b) (6)

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ANALYTICAL REPORT

AR-24-YI-002411-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4)	Sample Code: 129-2024-04150076	Sample Registration Date: 15Apr2024
	Client Sample Code: 411A1RSD03-5 8	Condition Upon Receipt: acceptable, 24.5°C
	Sample Description: Finished Wet Product Lot 3 - Homogeneity Can 8	Sample Reference: RCVD FELINE RENAL SUPPORT Lot 3

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference thod (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 26Apr2024
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Parameter		LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

Royal Canin

Client Code: YI0000062

PO#: LEO0US240041-01

(b) (6)

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AR-24-YI-002411-01

Received On: 15Apr2024

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(b) (4)

(b) (4), (b) (6)

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ANALYTICAL REPORT

AR-24-YI-002412-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4) Sample Code:	129-2024-04150077	Sample Registration Date:	15Apr2024
Client Sample Code:	411A1RSD03-5 9	Condition Upon Receipt:	acceptable, 24.5°C
Sample Description:	Finished Wet Product Lot 3 - Homogeneity Can 9	Sample Reference:	RCVD FELINE RENAL SUPPORT Lot 3

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference ethod (HPLC) - ECT	Accreditation ISO/IEC 17025:2017 A2LA 5492.01	Completed 26Apr2024
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Parameter		LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

Royal Canin

Client Code: YI0000062

PO#: LEO0US240041-01

(b) (6)

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AR-24-YI-002412-01

Received On: 15Apr2024

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(b) (4)

(b) (4), (b) (6)

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(b) (6)

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ANALYTICAL REPORT

AR-24-YI-002413-01

Received On: 15Apr2024
Reported On: 26Apr2024

(b) (4) Sample Code:	129-2024-04150078	Sample Registration Date:	15Apr2024
Client Sample Code:	411A1RSD03-5 10	Condition Upon Receipt:	acceptable, 24.5°C
Sample Description:	Finished Wet Product Lot 3 - Homogeneity Can 10	Sample Reference:	RCVD FELINE RENAL SUPPORT Lot 3

YI002 - Xanthophyll Profile (Lutein, Zeaxanthin)	Reference	Accreditation	Completed
	hod (HPLC) - ECT	ISO/IEC 17025:2017 A2LA 5492.01	26Apr2024

Parameter		LOQ
cis-Lutein	(b) (4)	0.03 µg/g
cis-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
trans-Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
Total Lutein	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
cis-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
trans-Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g
Total Zeaxanthin	(b) (4)	0.03 µg/g

Royal Canin

Client Code: YI0000062

PO#: LEO0US240041-01

(b) (6)

ANALYTICAL REPORT

500 Fountain Lakes Blvd, Suite 100
St. Charles, MO 63301

AR-24-YI-002413-01

Received On: 15Apr2024

Reported On: 26Apr2024



(b) (6)

Results shown in this report relate solely to the item submitted for analysis. | Any opinions/interpretations expressed on this report are given independent of the laboratory's scope of accreditation. | All results are reported on an "As Received" basis unless otherwise stated. | Reports shall not be reproduced except in full without written permission of (b) (4) | All work done in accordance with (b) (4) General Terms and Conditions of Sale: (b) (4) [terms_and_conditions.pdf](#) | √ Indicates a subcontract test to a different lab. Lab(s) are listed at end of the report. For further details about the performing labs please contact your customer service contact at (b) (4) Measurement of uncertainty can be obtained upon request.

(b) (4)	ANALYTICAL TECHNIQUE QUALITY CONTROL	(b) (4), (b) (6)
(b) (4)	(b) (4)	(b) (4), (b) (6)

1. OBJECTIVE

To determine the Carotenoid Profile in finished and semi-finished products and raw materials.

2. SCOPE

To establish the analytical technique for the determination of the carotenoid profile by HPLC.

Applies to raw material, semi-finished, finished product or any other sample whose specification requires it.

3. REFERENCES

(b) (4)

4. DEFINITIONS

(b) (4)

(b) (4)	ANALYTICAL TECHNIQUE QUALITY CONTROL	(b) (4), (b) (6)
(b) (4)		

(b) (4)

5. PRINCIPLE

To qualitatively determine the carotenoid profile content by liquid (b) (4)

6. RESPONSIBILITIES

(b) (4)

7. RESOURCES

(b) (4)

(b) (4)	ANALYTICAL TECHNIQUE QUALITY CONTROL	(b) (4), (b) (6)
(b) (4)		

(b) (4)

8. SAMPLE

(b) (4)

9. ENVIRONMENTAL CONDITIONS

(b) (4)

10. SAFETY AND ENVIRONMENTAL MEASURES

(b) (4)

11. CONTROL POINTS

(b) (4)

12. ANALYTICAL PROCEDURE

(b) (4)

	(b) (4)	ANALYTICAL TECHNIQUE QUALITY CONTROL	(b) (4), (b) (6)
	(b) (4)		

(b) (4)

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(b) (4)	ANALYTICAL TECHNIQUE QUALITY CONTROL	(b) (4), (b) (6)
(b) (4)	(b) (4)	(b) (4), (b) (6)

(b) (4)

13. CALCULATION AND PRESENTATION OF RESULTS

(b) (4)

14. FORMATS
Not Applicable

15. ANNEXES
Not Applicable

16. CHANGE CONTROL

(b) (4)	ANALYTICAL TECHNIQUE QUALITY CONTROL	(b) (4), (b) (6)
(b) (4)	(b) (4)	(b) (4), (b) (6)

NO. VERSION	SUMMARY OF CHANGES	DATE
01	Initial version.	02 September 2023

(b) (4)

MOV-14-003

Single Laboratory Method Validation

Measurement of Lutein in Oil Using Silica HPLC Column

Validation Performed by: [REDACTED]

Date: [REDACTED]

Authorizing Personnel: [REDACTED]

Date [REDACTED]

(b) (4), (b) (6)

(b) (4)

1. Title:

Single Laboratory Method Validation for the Measurement of Lutein in Oil Using Silica HPLC Column

2. Scope (Applicability):

This method is applicable to the determination of lutein concentration in oil. The method is appropriate for both the esterified and free forms.

3. Method:

Normal-Phase Silica HPLC

(b) (4)

(b) (4), (b) (6)

(b) (4)

(b) (4)

3-3: Sample Preparation and Extraction:

(b) (4)

(b) (4), (b) (6)

(b) (4)

(b) (4)

(b) (4), (b) (6)

(b) (4)

4. Single laboratory validation study design:

(b) (4)

(b) (4), (b) (6)

(b) (4)

(b) (4)

5. Results

(b) (4)

(b) (4), (b) (6)

(b) (4)

(b) (4), (b) (7)(A)

(b) (4)


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(b) (4), (b) (6)

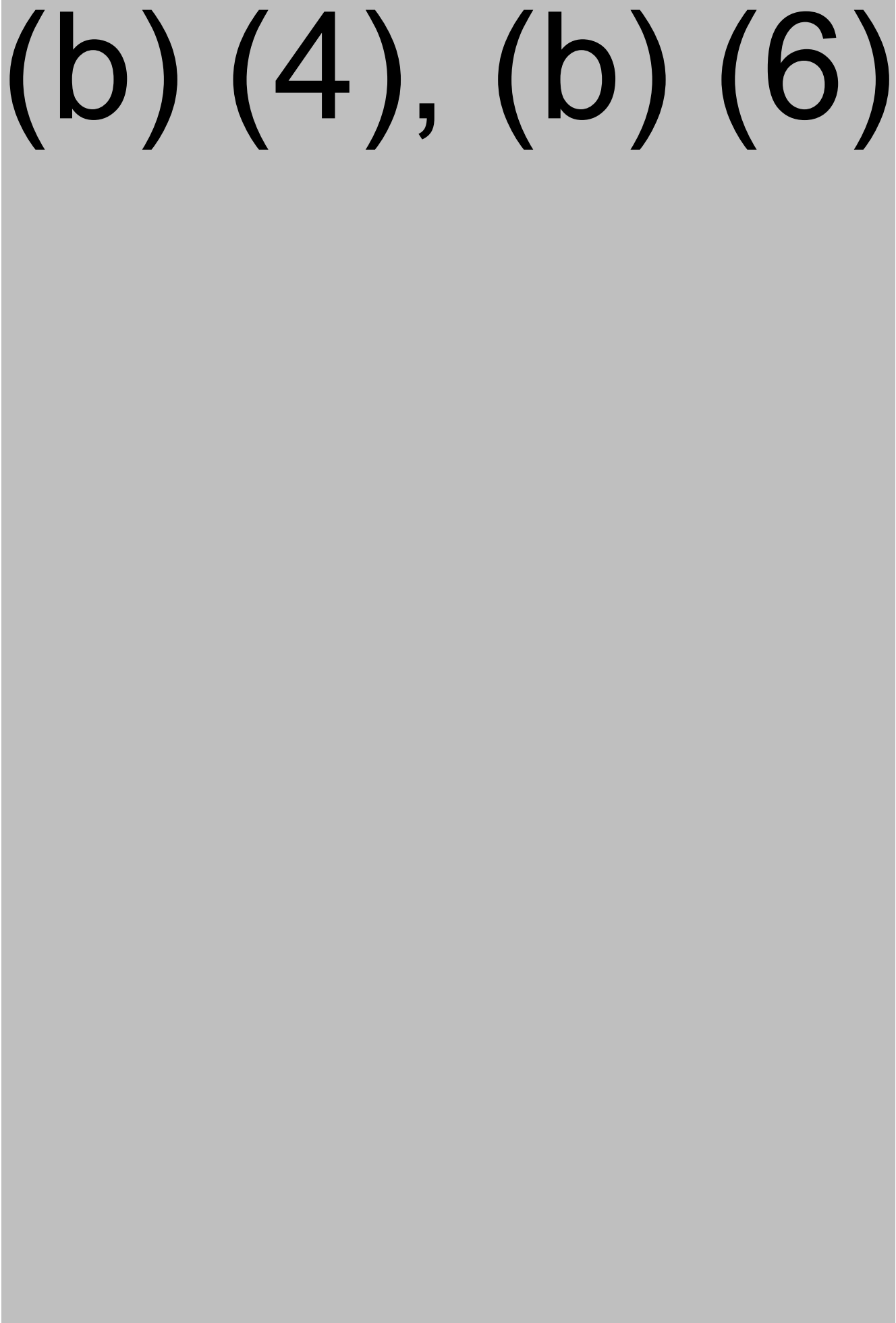
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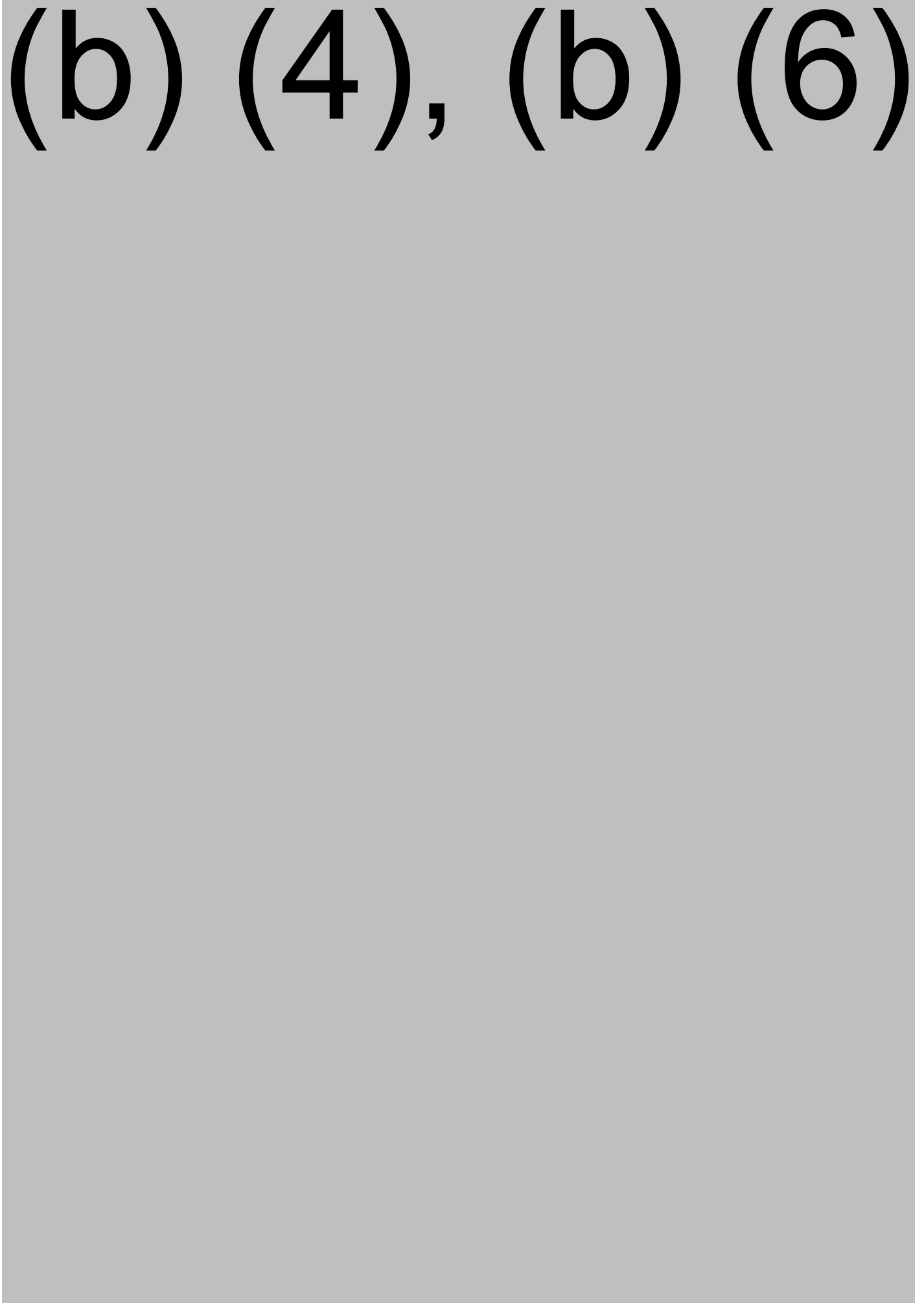
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(b) (4), (b) (6)

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(b) (4)

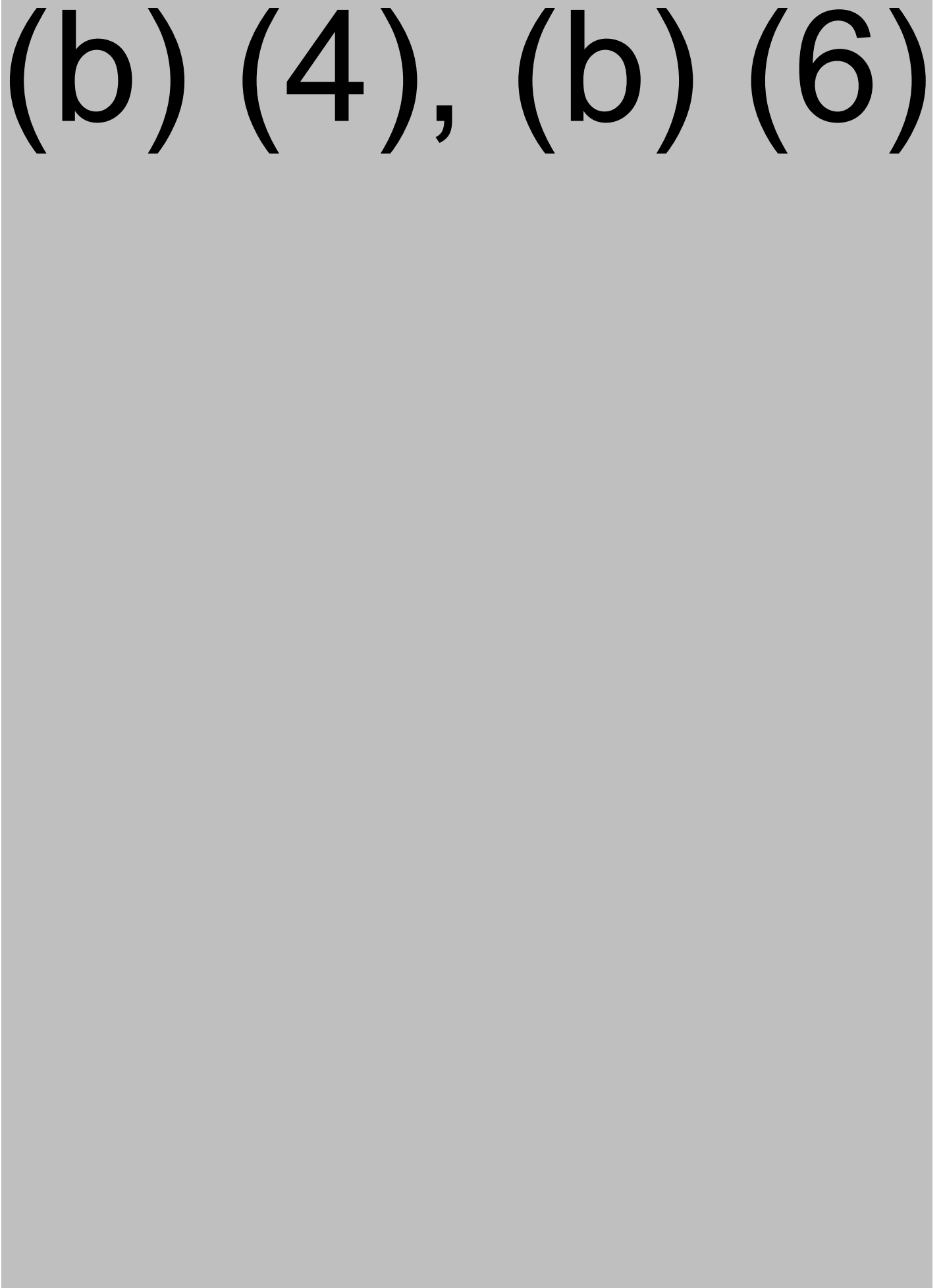
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MOV-14-003

Biennial Review

[Redacted]

[Redacted]

[Redacted]

[Redacted]

The current version of all Instrument Operating Procedures and Laboratory Operating Procedures are available from the CTI Server.

Site: [Redacted]

Please ensure that you have the latest version.

Revision History

Rev. no.	Description of Revision	Date
0	Original	18 June 2014

(b) (4), (b) (6)

(b) (4)

(b) (4), (b) (6)

GRAS Panel Statement on the Generally Recognized as Safe (GRAS) Conclusion for the Proposed Use of Marigold Extracts in Food for Dogs and Cats

The undersigned, an independent panel of experts, qualified by their scientific training and national and international experience to evaluate the safety of food and food ingredients (the “GRAS Panel”), was specially convened by Royal Canin to conduct a critical and comprehensive evaluation of the available pertinent data and information, and conclude whether, under the conditions of intended use of marigold extract as a nutritional antioxidant, in pet food (dogs and cats), is safe and “generally recognized as safe” (GRAS) based on scientific procedures as stated under FDA’s GRAS Notification Program (21 CFR §570.30(a)(1). For purposes of this evaluation, “safe” or “safety” as it relates to GRAS within the terms of the Federal Food, Drug, and Cosmetic Act means that there is a reasonable certainty of no harm under the intended conditions of use of the ingredient in foods, as stated in 21 CFR §570.3(i).

Royal Canin performed a comprehensive search of the scientific literature, through November 2024, relating to the safety of the use of marigold extract and lutein in food for humans and pet animals, (dogs and cats). Royal Canin summarized the results of the literature search and prepared a GRAS dossier, “**The Generally Recognized as Safe (GRAS) Status of Marigold Extract Derived from *Tagetes erecta* for Use in Food for Cats and Dogs**” for consideration by the GRAS Panel.

The GRAS Panel consisted of the following individuals: Robert Poppenga, DVM, Ph.D., DABVT, Michael Lindinger, Ph.D. and James La Marta, Ph.D.(Panel Chair). The GRAS Panel critically evaluated the safety documentation (the dossier), and other available data and information that the members of the GRAS Panel believed to be pertinent to the safety of the use of Marigold Extracts in pet food.

On 3 December 2024, the GRAS Panel convened via web conference, and independently, jointly, and unanimously concluded that Royal Canin’s proposed use, of Marigold Extracts, produced consistent with current good manufacturing practice (“cGMP”) and meeting the stated specifications, is safe for its intended use as an antioxidant in dog and cat food. The GRAS Panel further concluded unanimously that the intended use of the two marigold extracts is GRAS based on scientific procedures. It is also the unanimous consensus opinion of this GRAS Panel that other qualified experts reviewing the same information would concur with these conclusions.

Summarized below are the data, information, and interpretive analysis supporting the GRAS Panel’s conclusions.

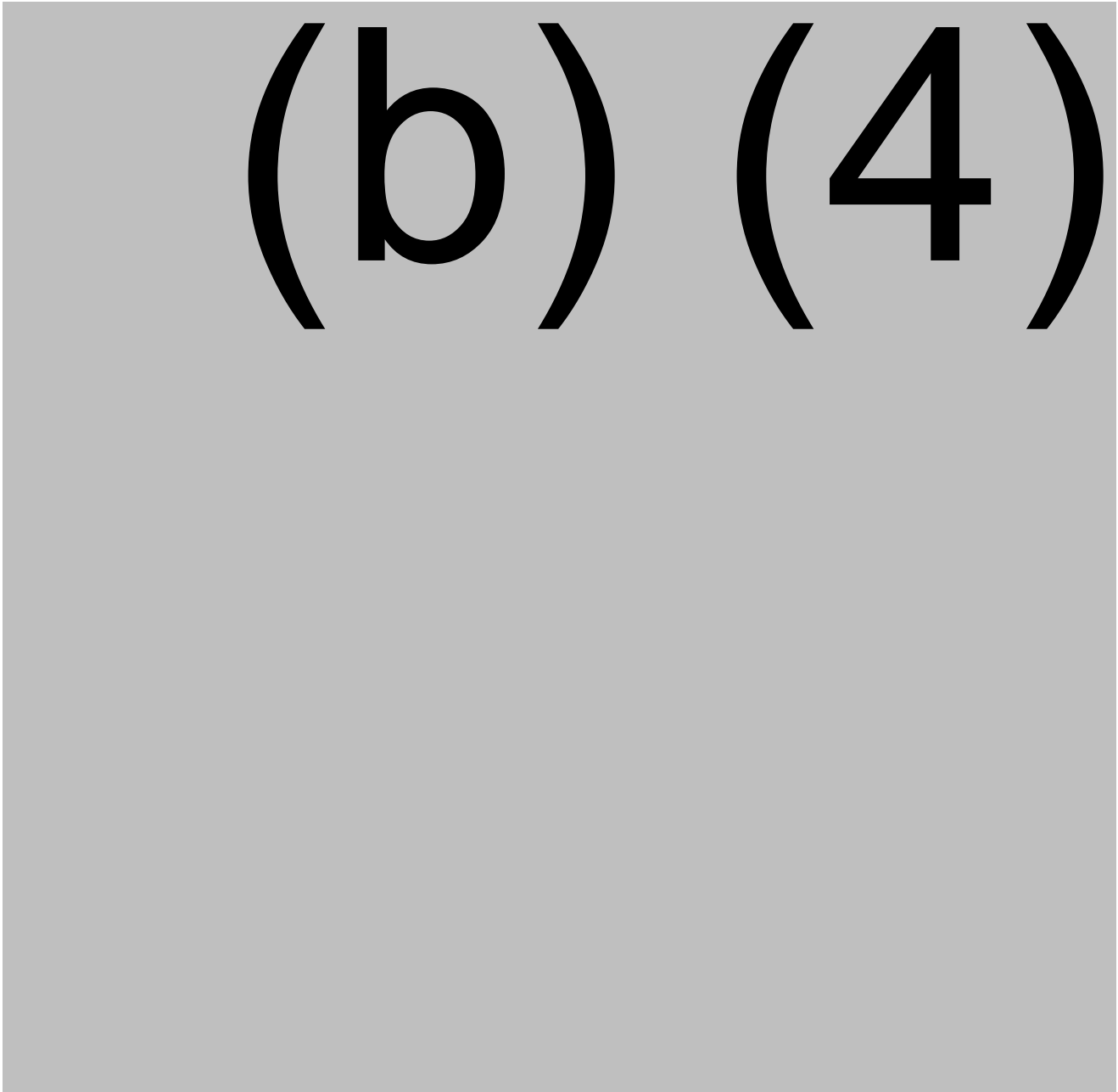
Summary and Basis for GRAS Determination

Identification

Royal Canin uses two different marigold extracts produced by two suppliers via solvent extraction using hexane to produce a lipophilic oleoresin rich in lutein, One of the oleoresin producers saponifies the lutein esters to provide ‘free’ lutein. Both products are standardized to where lutein

is a minimum of 70% of the carotenoids.

Figure 1 **Process flow charts**



Three non-consecutive batches of marigold extract from each supplier were produced and analyzed for conformance to the supplier's and Royal Canin's specifications. The results of the analyses are in the following tables.

Table 1 Batch analysis results for the two marigold extracts

Principal Components	A) (b) (4) Sample ID (Lot #)	
	Marigold Oleoresin	
Total Carotenoids (g/kg)	(b)	(4)
Lutein (g/kg)	(b)	(4)
% Lutein of total carotenoids	(b)	(4)
Zeaxanthin (g/kg)	(b)	(4)
% Zeaxanthin of total carotenoids	(b)	(4)
Waxes (%)	(b)	(4)
Moisture (%)	(b)	(4)
Ash (%)	(b)	(4)
Fatty Acids (%)	(b)	(4)
Principal Components	B) (b) (4) Sample ID (Lot #)	
	Saponified Marigold Oleoresin	
Total Carotenoids (g/kg)	(b)	(4)
Lutein (g/kg)	(b)	(4)
% Lutein of total carotenoids	(b)	(4)

Zeaxanthin (g/kg)	(b) (4)
% Zeaxanthin of total carotenoids	
Waxes (%)	
Moisture (%)	
Ash (%)	
Fatty Acids (%)	

Lutein is between 11 and 13% of the marigold extracts.

Batches were evaluated for heavy metals and microbial contaminants and found to be within acceptable limits for pet food.

Table 2 Contaminant levels in the (b) (4) marigold extract

Parameter	Method	Analytical Data		
		Lot	Lot	Lot (b) (4)
Heavy Metals				
Cadmium	J. AOAC vol. 90 (2007) 844-856 (Mod)	(b) (4)	(4)	
Arsenic	J. AOAC vol. 90 (2007) 844-856 (Mod)			
Lead	J. AOAC vol. 90 (2007) 844-856 (Mod)			
Mercury	J. AOAC vol. 90 (2007) 844-856 (Mod)			
Residual Solvents				
n-Hexane	USP/NF 467			(b) (4)
Dioxins and PCBs				
Dioxins and furans TEQ-WHO (lower-bound, only PCDD/F)	EPA 1613B Oct. 1994			(b) (4)

Dioxins and furans TEQ-WHO (upper-bound, only PCDD/F)	EPA 1613B Oct. 1994	(b) (4)
Microbiology		
<i>Salmonella</i>	FDA BAM Chapter 5	(b) (4)

Table 3 Contaminants in the (b) (4) marigold extract

Parameter	Method	Analytical Data			
		Lot	Lot	Lot	
		(b) (4)	(b) (4)	(b) (4)	
Heavy Metals					
Cadmium	Official Mexican Standard. NOM-117-SSA1 (1994)	(b) (4)			g
Arsenic	AOAC, 2019. AOAC Official Methods 952.13				g
Lead	Official Mexican Standard. NOM-117-SSA1 (1994).				g
Mercury	National Standards Institute. NCh 2667. Of2001				
Residual Solvents					
		Lot	Lot	Lot	(b) (4)
n-Hexane	Gas Chromatography	(b) (4)			
Dioxins and PCBs					
		Lot	Lot	Lot	(b) (4)
Dioxins and furans TEQ-WHO (lower-bound, only PCDD/F)	GLS DF 110:2022-06-30, GC-MS/MS	(b) (4)			

Dioxins and furans TEQ-WHO (upper-bound, only PCDD/F)	GLS DF 110:2022-06-30, GC-MS/MS	(b) (4)		
Sum of dioxins and dioxin-like PCBs TEQ-WHO (lower-bound, WHO-PCDD/F+PCB TEQ)	DF:110-3/120-3/130-3/140-4, Calculation			
Sum of dioxins and dioxin-like PCBs TEQ-WHO (upper-bound, WHO-PCDD/F+PCB TEQ)	DF:110-3/120-3/130-3/140-4, Calculation			
Microbiology				
		Lot	Lot	Lot (b) (4)
<i>E. Coli</i>	UNE-EN ISO 16649-3 2017	(b) (4)		
<i>Salmonella</i>	ISO 6579-1:2017/AMD 1:2020			
Yeasts	ICMSF Food Microorganisms			
Molds	ICMSF Food Microorganisms			
<i>S. Aureus</i>	FDA Bacteriological Analytical On line. Hypertext.source. Chapter 12. 8th Ed. Revision A, 1998. January 2001			

Stability

Both suppliers claim that their products are stable at room temperature for at least 12 months, which is well within Royal Canin's normal consumption time.

Royal Canin analyzed batches of pet food kibble which are produced via extrusion which not only heats the ingredients but incorporates air due to the mixing action of the elements on the extruder shafts. Batches of 'wet food' which is heat processed in a retort were also evaluated

Analysis of three samples of each product type show that the lutein concentration was stable for 18 months for the kibble format and 24 months for the 'wet food, (canned), which indicates that the ingredient is stable over the typical shelf life of the two product types.

Figure 2 Stability of lutein in kibble pet food

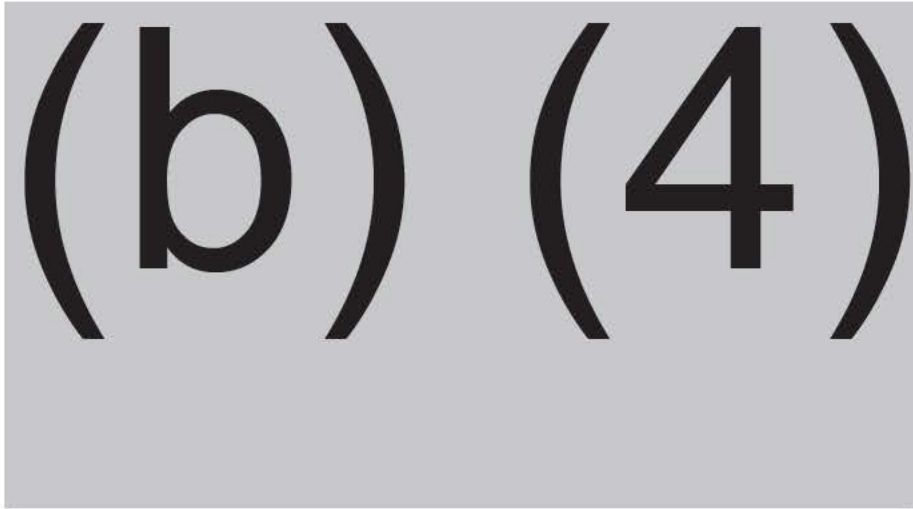
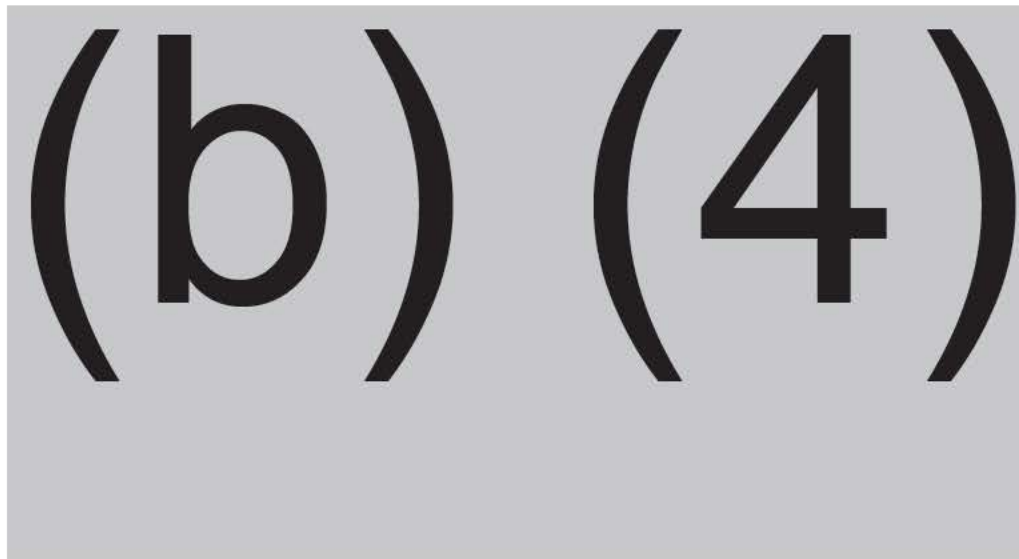


Figure 3 Stability of lutein in wet pet food



Exposure

Royal Canin followed the recommendations of the National Research Council's dog and cat publication of 2006 to calculate the quantity of lutein that puppies and adult dogs and kittens and adult cats would consume at the proposed use levels. Royal Canin used body weights of both large and small breeds to bracket the range of possible exposures. The lutein content of the extracts was considered to be 10.3% for the exposure calculations, which is below the levels found in the batches. Because Royal Canin uses the lutein content of the extracts to determine the

quantity of marigold extract added to the food, the maximum exposure levels will not be exceeded.

Table 4 Estimated Daily Intake Levels for (b) (4) (b) (4)

Weight *	Food, DM	Lutein		Marigold Extract (Oleoresin)	
		Typical	Maximum	Typical	Maximum
[kg]	[g/Day]	[mg/kg BW/day]		[mg/kg BW/day]	
Adult Dogs					
5	108.7	0.43	1.74	4.23	16.9
50	611.1	0.24	0.98	2.38	9.51
Adult Cats					
4	63.3	0.32	1.27	3.08	123
Puppies					
1.5 (5)	94.5	1.26		12.2	
17 (35)	483.6	0.57		5.53	
Kittens					
0.8 (4)	44.0	1.10	4.40	10.7	42.7

*Expected adult weight is given in parentheses for puppies and kittens

Table 5 Estimated Daily Intake Levels for (b) (4) (b) (4)

Weight *	Food, DM	Lutein		Marigold Extract (Oleoresin)	
		Typical	Maximum	Typical	Maximum
[kg]	[g/Day]	[mg/kg BW/day]		[mg/kg BW/day]	
Adult Dogs					
5	108.7	0.43	1.74	4.78	19.1
50	611.1	0.24	0.98	2.69	10.76
Adult Cats					
4	63.3	0.32	1.27	3.48	13.9
Puppies					
1.5 (5)	94.5	1.26		13.9	
17 (35)	483.6	0.57		6.26	
Kittens					
0.8 (4)	44.0	1.10	4.40	12.09	48.4

*Expected adult weight is given in parentheses for puppies and kittens

Safety Information

The safety of the use of the marigold extracts was established by the critical review of published information regarding its potential toxicity in rodents, and two key studies one with dogs and one with cats. A supporting study with a wild feline was also examined.

Genotoxicity

An Ames Test with a commercial product containing lutein was tested using the standard plate incorporation assay and a preincubation assay in the presence or absence of an exogenous metabolic activation system (S9). The tester strains used were TA1535, TA97, TA98, TA100 and TA102. No cytotoxic effects as evidenced by a reduction of background colony numbers were apparent for any of the strains with the possible exception of strain TA102 in the absence of the metabolic activation system. No increase in the number of mutant colonies was observed with the product, (Kruger, et al., 2002).

Acute Study

A 28-day study with 6 rats/sex/dose was performed with 6 dose levels of lutein, plus control to provide 0, 2.6, 7.7, 26.0, 77.3, 260 and 773.2 mg/kg bw/day. Full necropsies at the end of the study period found Hematology and clinical chemistry analysis revealed sporadic, statistically significant effects on several parameters compared with the control. There was no consistent dose response, changes were small and there was no correlation of the changes with any adverse treatment-related histopathology findings. The changes were not considered to be treatment related or biologically significant. The authors concluded that lutein provided to rats at dose levels up to 773.2 mg/kg/day for 4 weeks did not result in test article related toxicity and was well tolerated, (Kruger, et al., 2002).

Sub-chronic studies

Rodents

A 13-week study conducted according to OECD Test Guideline 408 was performed with Han Wistar rats (10/sex/dose fed a high lutein marigold extract in food at 0, 2.6, 26 and 260 mg/kg bw/day. Five animals from the control and five from the highest dose tested were allowed a 4-week recovery period prior to necropsy. The remainder were necropsied immediately following the treatment period. No clinical symptoms or changes to hematology, clinical chemistry or histopathology were observed. The only death was attributable to blood sampling. The highest dose of 260 mg/kg bw/day was identified as the NOAEL. The NOAEL for lutein from this study is about 195 mg/kg bw/day based on a concentration of 75% in the extract, (Kruger, et al., 2002). Royal Canin calculated that the NOAEL for the non-xanthophyll portion in this study would have been about 52 mg/kg bw/day.

Felines

Female cats were fed supplemental lutein from marigold extract at doses of 0, 0.71, 3.54 or 7.09 mg/kg bw/day for twelve weeks (14 cats/dose). Although designed to evaluate immune effects of dietary lutein rather than to directly assess safety, no significant change in body weight or other adverse effects were observed in this study. Modulation of cell-mediated and humoral immune responses were considered beneficial. (Kim, et al., 2000a). Royal Canin calculated the exposure to the non-xanthophyll material from the marigold extract at the highest dose to be 1.68 mg/kg bw/day based on the reported concentration of 81.89% of lutein and zeaxanthin combined. The

NRC used this study to conclude the Presumed Safe Intake of lutein for cats is 7.2 mg/kg bw/day, (NRC, 2009).

A recent study explored the potential benefits of lutein supplementation in the Indian leopard (*Panthera fusca*), a wild cat species that, like the domestic cat, belongs to the Felidae family, to assess its impact on antioxidant status, immune function, and stress in captive animals. Captive Indian leopards, typically fed carabeef on bone (CBB) diets, lack carotenoids—compounds that their wild counterparts obtain from natural prey. In a controlled experiment using a 3×3 replicated Latin square design, nine adult leopards (5 male, 4 female) were supplemented with 0, 20, or 40 ppm of lutein, with all leopards receiving diets containing each of the three treatments sequentially. Lutein supplementation at 20 ppm significantly enhanced antioxidant status and immune function, increasing serum protein, globulin, and carotenoid levels, while alleviating stress markers through notable reductions in malondialdehyde (MDA) and fecal cortisol concentrations. Additionally, supplementation improved crude protein digestibility and increased lymphocyte transformation test (LTT) index and immunoglobulin levels. Overall, lutein supplementation at 20 ppm optimally compensates for carotenoid deficiencies in captive Indian leopards, enhancing immunity, reducing stress, and improving overall health (Durge et al., 2022).

Canines

Dogs were supplemented with lutein at doses of 0, 0.44, 0.91 and 1.82 mg/kg bw/day for twelve weeks to identify potential changes in the immune system. Bodyweight was unchanged, and no adverse effects were reported. Enhanced cell-mediated and humoral responses were considered beneficial, (Kim, et al., 2000b). Royal Canin calculated that at the highest dose, exposure to the non-xanthophyll material in the extract was 0.41 mg/kg bw/day. The NRC used this study to conclude that the Presumed Safe Intake of lutein for dogs is 1.8 mg/kg bw/day., (NRC, 2009)

Summary

Royal Canin proposes to use two different marigold extracts as sources of lutein for addition to food for dogs and cats with the purpose of being a nutritional antioxidant. Royal Canin has noted in their literature search that several lutein containing materials have been concluded to be GRAS for use as a nutritional antioxidant when added to human food products.

Data for production batches indicates that the extracts can be produced consistently with low levels of heavy metals, microbial contaminants within industry accepted norms and low concentrations of non-xanthophyll substances. The solvent residue is below the minimum risk level even at doses above the proposed use levels.

Lutein is not genotoxic based upon the Ames Test.

A 13-week rodent study found no test article adverse effects at the high dose of 260 mg/kg bw/day which was equivalent to 195 mg/kg bw/day.

More importantly, a study with cats found the NOAEL to be the high dose, 7.2 mg/kg bw/ day and a study with dogs found the NOAEL to be 1.82 mg/kg bw/day. A study with another feline species, leopards found no adverse effects at 20 mg/kg of food.

Royal Canin proposes to add the marigold extracts to dog to deliver lutein at 80 mg/kg of adult dog food and 20 mg/kg of puppy food which will result in exposures below the NRC presumed safe intake level of 1.8 mg/kg bw/day.

Royal Canin proposes to add the marigold extracts to cat food to deliver lutein at 80 mg/kg of adult cat food and 80 mg/kg of kitten food which will result in exposures below the NRC presumed safe intake level of 7.2 mg/kg bw/day.

CONCLUSION

We, the undersigned independent qualified members of the GRAS Panel, have individually and collectively, critically evaluated the data and information summarized above, as well as other data and information that we deemed pertinent to the safety of the intended conditions of use of marigold extracts that is the subject of this evaluation for use as a nutritional antioxidant in dog and cat food. We unanimously conclude that the proposed use of these extracts produced in a manner that is consistent with current Good Manufacturing Practice (cGMP) and meeting appropriate established specifications as presented in the supporting dossier "**The Generally Recognized as Safe (GRAS) Status of Marigold Extract Derived from *Tagetes erecta* for Use in Food for Cats and Dogs**" is safe for use at levels of up to 48 mg/kg of food for adult cats and kittens, and up to 13.9 mg/kg of food for puppies and 16.9 mg/kg of food for adult dogs.

We, the members of the GRAS Panel, further unanimously conclude that the intended use of marigold extracts, produced in a manner that is consistent with current Good Manufacturing Practice (cGMP) and meeting appropriate established specifications as presented in the supporting dossier is Generally Recognized as Safe (GRAS) based on scientific procedures, under the intended conditions of use in dog and cat food.

It is our professional opinion that other qualified experts critically evaluating the same information would concur with this conclusion.

(b) (6)

Robert Poppenga, DVM, Ph.D., DABVT
(Panel Member)

Date

(b) (6)

Michael Lindinger, Ph.D.
(Panel Member)

Date

(b) (6)

James La Marta, Ph.D., CFS
(Chair)

Date

References

Durge, S.M., Das, A., Saha, S.K., Pande, A., Thakuria, D., Saxena, A., Bhardvaj, Y., Verma, A.K, 2022. Dietary Lutein Supplementation Improves Immunity and Antioxidant Status of Captive Indian Leopards (*Panthera fusca*). *Zoo Biology*, 1-12.

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