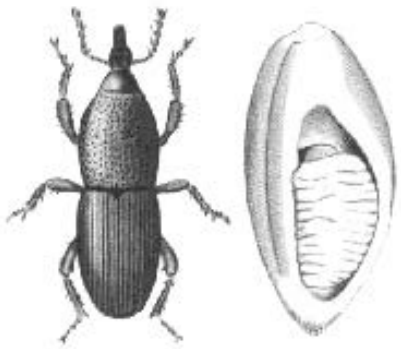
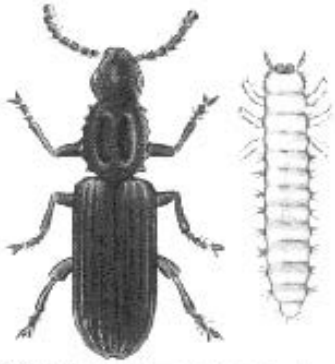
PRINCIPAL STORED GRAIN INSECTS

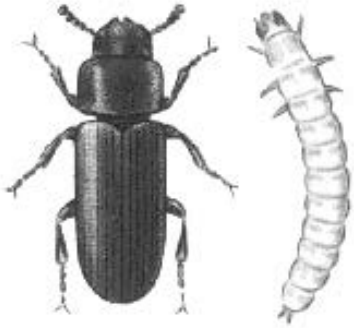
For safe and effective use of insecticides, always identify the problem correctly.



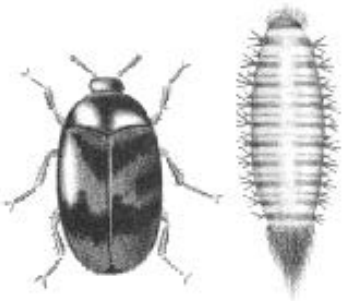
1. Granary weevil



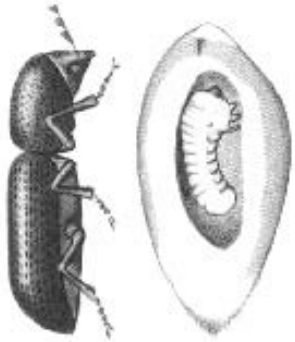
2. Saw-toothed grain beetle



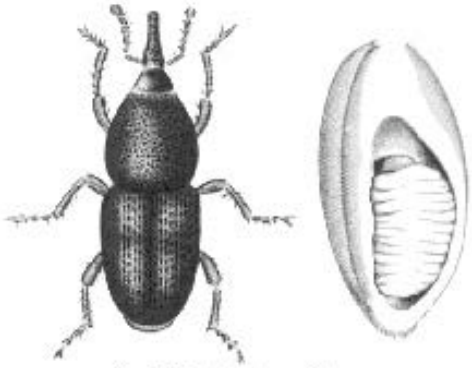
3. Red flour beetle



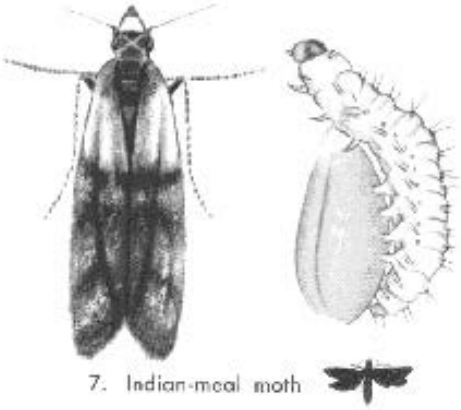
4. Larger cabinet beetle



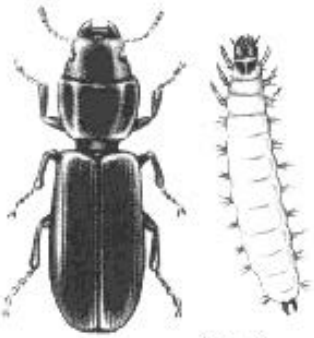
5. Lesser grain borer



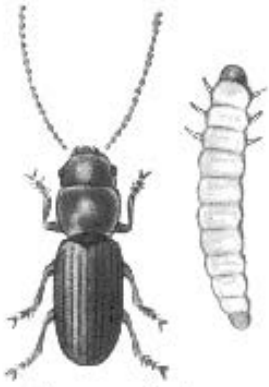
6. Rice weevil



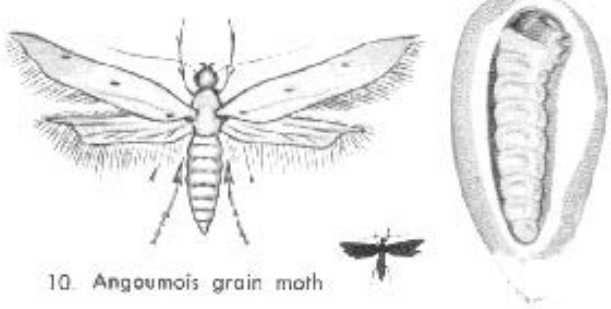
7. Indian-meal moth



8. Cadelle



9. Flat grain beetle



10. Angoumois grain moth

Some of these stored grain insects are also KITCHEN PESTS.

The saw-toothed grain beetle, red flour beetle, larger cabinet beetle, and Indian-meal moth develop in flour, cake mixes, corn meal, breakfast foods and similar products. The Angoumois grain moth infests popcorn.

Prepared by Extension Entomologists of the North Central States in cooperation with the Federal Extension Service, U. S. Department of Agriculture

FACT SHEET ON PRINCIPAL STORED GRAIN INSECTS

THE INFORMATION OUTLINED BELOW IS REPRINTED WITH PERMISSION, AND ADAPTED FROM PUBLICATION E-80, APRIL, 1967, DEPARTMENT OF ENTOMOLOGY, COOPERATIVE EXTENSION SERVICE, PURDUE UNIVERSITY, LAFAYETTE, INDIANA 47907.

1. GRANARY WEEVIL, Sitophilus granarius (Linnaeus). This true weevil, along with the closely related rice weevil, is among the most destructive of all stored grain insects. The larvae develop inside kernels of whole grain in storage, thus making an infestation difficult to remove in the milling process. Therefore, the granary weevil is largely a pest of stored wheat, corn and barley, especially in elevators, mills and bulk storages. The adult cannot fly, and field infestations do not occur.
2. SAW-TOOTHED GRAIN BEETLE, Oryzaephilus surinamensis (Linnaeus). Along with flour beetles, the saw-toothed grain beetle is one of the most common insects in stored grain and cereal products. The larvae develop in flour, cereal products and many other dried foods, For this reason, it is a common pest not only in grain bins, but also in elevators, mills, processing plants, warehouses and kitchens. In grain bins, it feeds on broken kernels and grain residues.
3. RED FLOUR BEETLE, Tribolium castaneum (Herbst). This beetle is similar to the saw-toothed grain beetle in habits and types of products infested. It is a serious pest in flour mills and wherever cereal products and other dried foods are processed or stored. Like the confused flour beetle (not pictured), the red flour beetle may impart a bad odor that affects the taste of infested products.
4. LARGER CABINET BEETLE, Trogoderma inclusum (LeConte). Representing a group also referred to as Trogoderma, the larger cabinet beetle is a scavenger that feeds on cereal products and dried animal matter. The fuzzy, slow-moving larvae - similar to the larvae of carpet, hide and larder beetles - are often found crawling about on or near the products they infest.
5. LESSER GRAIN BORER, Rhyzopertha dominica (Fahricius). This pest is most common and destructive in warm climates but can spread to any area in transported grain. It is a problem of grain only and not cereal products. The larvae develop inside the kernels of whole grain. The adults also damage grain by boring into the kernels and leaving them covered with powder from the chewed material.
6. RICE WEEVIL, Sitophilus oryzae (Linnaeus). The rice weevil is similar to the granary weevil in both appearance and habits. The name is misleading, however, since it infests other grains besides rice. Adults can fly and, in warm climates, can cause widespread damage to corn, wheat and other grains before harvest.
7. INDIAN-MEAL MOTH, Plodia interpunctella (Hubner). Common to both stored grain and cereal products, Indian-meal moth larvae cause damage in corn meal, packaged foods, bagged grain and grain in storage. Attack is confined to surface layers of stored shelled corn and small grains. In the case of stored ear corn, however, feeding occurs anywhere, since the moths crawl among the ears to lay their eggs. Larval feeding is characterized by a webbing of the material infested. The mature larvae then often leave the material and crawl about in homes or buildings in search of a place to pupate.
8. CADELLE, Tenebroides mauritanicus (Linnaeus). Both the adult and larva are large and easy to see. Both stages feed mainly on the germ of stored grains, but may also attack milled cereal products. The larvae leave stored grain in the fall and burrow into woodwork, such as wooden bins or boxcars, to hibernate. They may also burrow into packaged cereal products, thus providing an entrance for other cereal pests.
9. FLAT GRAIN BEETLE, Cryptolestes pusillus (Schonherr). This is a tiny beetle that feeds primarily on the germ of stored grains, especially wheat. It is readily attracted to high-moisture grain. In fact, under high moisture conditions, the flat grain beetle may also develop in many cereal products, but it is not a common pest in kitchens.
10. ANGOUMOIS GRAIN MOTH, Sitotroga cerealella (Olivier). This is a common and destructive pest of crib ear corn. It also infests stored shelled corn and other small grains, but attack is confined to the surface layer of grain. The larvae develop within the kernels; therefore, the Angoumois grain moth is not a pest of cereal products. Infestations in homes often occur in stored popcorn or in colored ears of corn kept for decoration purposes. The moth resembles the clothes moth but does not shun light.

<u>KHAPRA BEETLE</u>

BACKGROUND

A native of India, the Khapra Beetle has spread to other countries in Asia, Africa, Europe, & North America. While it thrives best in warm climates, there is evidence that the beetle can survive cold winter months in heated warehouses and grain storage tanks. The beetle is a sluggish insect. It cannot fly and is spread entirely by shipping & trade. The problem of preventing the insect's spread is compounded by its ability to survive for several years without food & by its habit of hiding in cracks, crevices, and even behind paint scales. Left uncontrolled, they can make the surface of a grain bin come literally alive with millions of wiggling larvae eating their way down to the bottom.

HOSTS

In addition to the obvious grain and stored product hosts, the beetle turns up in a variety of locations that would not be obvious food sources for the pest. It is often found in the ears & seams of burlap bags & wrappers, in baled crepe rubber, automobiles, steel wire, books, corrugated boxes (glue), bags of bolts, & even soiled linen & priceless oil paintings. It is frequently intercepted on obvious food products such as rice and peanuts as well as dried animal skins. Such infestations result from storage of the

products in infested warehouses, by transportation in infested carriers or from re-use of sacks that previously contained products infested by the Khapra Beetle.

DETECTION

Except for some attempts to develop traps and lures for the Khapra Beetle, the only sure inspection is visual. Certainly this is a meticulous chore because of the tiny size of the Khapra Beetle.

High risk areas first checked include:

1. Cracks in flooring & walls
2. Behind loose paint
3. Along pallets
4. Seams of burlap bags
5. Any low light areas & dark crevices
6. Trash from cleaning devices

Low risk areas for inspection include:

1. Well-lighted areas or areas where sun-light penetrates
2. Areas which are moist or where debris are covered by mold

Vacuum cleaners are now being used by inspectors to assist the inspection process to draw larvae & cast skins out of cracks & crevices. Filters are changed between inspection locations.

LIFE CYCLE AND DESCRIPTION

The tell-tale signs of a Khapra Beetle infestation are the larvae & their cast skins. The larvae are yellowish or reddish brown. Clothed with long barbed brown hairs, the larva has a tuft of longer hairs which gives it the typical carpet beetle larva look. Adults are brown to blackish in color with indistinct red-brown markings on the wing covers. Hairy on top, they may have a slick appearance when hairs are rubbed off. Mature larvae and adult females are about 1/8 inch long; males are somewhat smaller. They pass through 5-9 moults during this stage, resulting in numerous cast skins. Adults are short-lived, persisting for a few days at temperatures over 100°F, or for perhaps several months or even years, at temperatures below 50°F. Adult activity is little noticed except at dusk, while remnants are seldom found as they are cleaned up by larvae. Mating occurs almost immediately following adult emergence, and egg deposition follows in from 1 to 6 days. Eggs are laid loosely among the host material infested. Hatching follows from 1 week to 2 weeks after deposition. Two types of larvae, short or long cycle, may develop. Under optimum conditions, the larval stage may be completed in less than a month, whereas under crowded, starving or cold conditions, long cycle larvae may hide out in large numbers in building crevices and may persist from several months to 3 years without food.

TREATMENT

Fumigation using methyl bromide is the treatment of choice. Because the pest secrets itself in cracks & crevices of the building it is in, in addition to the contents, the whole building must be treated. Typically, the building is covered tightly with tarpaulins and fumigant is pumped in at the approved rate of 6 to 9 pounds per 1,000 cu. ft. The process takes several hours depending on the size of the building, and strict safety precautions are taken.

MISCELLANEOUS FACTS

1. Last Khapra Beetle significant incident: 1978, single infested warehouse in Linden, NJ.
2. Last infestation found and eradicated: 1966.
3. Domestic quarantine revoked: September 2, 1972
4. Original find in U.S.: grain warehouse at Alpaugh, CA, November, 1973.
5. Infestations subsequently found and eradicated in Arizona, California, New Mexico, Texas, & Mexico.
6. Report suspected Khapra beetle infestations to State or Federal plant pest control inspectors. Collect samples in vials of alcohol. Submit samples of suspected Khapra Beetles to your District lab or mail to:

    U.S. Department of Agriculture
    Plant Protection& Quarantine Program
    Federal Building
    Hyattsville, Maryland 20782

LIFE CYCLES OF SELECTED STORAGE INSECTS

*These figures are approximate, and depend on food and environmental factors.

Insect	Number Eggs laid by female	Length of egg stage (days)	Length larval or nymphal stage (days)	Days of Total Development	Length of Adult Life
Coleoptera (Beetles)					
Cigarette/drug store	100	12-17	36-200	60-240	2-6 weeks
Cadelle	1000	7-10	60-400	85-400	1-2 years
Skin	100-200	7-14	30-700+	50-800+	2-4 weeks
Flat grain	100-400	3-4	20-80	40-90	1-12 months
Granary/Rice/Maize	50-400	3-5	10-30	25-50	4-8 months
Flour	350-400	4-12	20-100	30-120	to 3 years
Sawtooth/Merchant	20-285	3-5	14-50	20-70	6 months to 3 years
Lepidoptera (moths)					
Angoumois	40-389	7-14	25-100	35-150	2-15 days
Almond/Raisin/Tobacco	20-400	3-4	20-60	35-60	2-26 days
Indian Meal	100-300	3-4	21-120	45-150	2-25 days
Mediterranean Flour	100-400	3-9	22-120	30-150	9-14 days
Diptera (flies)					
Housefly	200-1000	1-3	3-60	6-65	19-50 days
Drosophila	400-900	1-2	3-8	7-12	2-5 months
Blattodea (Cockroaches)	100-1000	35-100	30-500	65-600	up to 2.5 years

PERPETUAL JULIAN CALENDAR

For NON-LEAP YEARS*

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
1	1	32	60	91	121	152	182	213	244	274	305	335	1
2	2	33	61	92	122	153	183	214	245	275	306	336	2
3	3	34	62	93	123	154	184	215	246	276	307	337	3
4	4	35	63	94	124	155	185	216	247	277	308	338	4
5	5	36	64	95	125	156	186	217	248	278	309	339	5
6	6	37	65	96	126	157	187	218	249	279	310	340	6
7	7	38	66	97	127	158	188	219	250	280	311	341	7
8	8	39	67	98	128	159	189	220	251	281	312	342	8
9	9	40	68	99	129	160	190	221	252	282	313	343	9
10	10	41	69	100	130	161	191	222	253	283	314	344	10
11	11	42	70	101	131	162	192	223	254	284	315	345	11
12	12	43	71	102	132	163	193	224	255	285	316	346	12
13	13	44	72	103	133	164	194	225	256	286	317	347	13
14	14	45	73	104	134	165	195	226	257	287	318	348	14
15	15	46	74	105	135	166	196	227	258	288	319	349	15
16	16	47	75	106	136	167	197	228	259	289	320	350	16
17	17	48	76	107	137	168	198	229	260	290	321	351	17
18	18	49	77	108	138	169	199	230	261	291	322	352	18
19	19	50	78	109	139	170	200	231	262	292	323	353	19
20	20	51	79	110	140	171	201	232	263	293	324	354	20
21	21	52	80	111	141	172	202	233	264	294	325	355	21
22	22	53	81	112	142	173	203	234	265	295	326	356	22
23	23	54	82	113	143	174	204	235	266	296	327	357	23
24	24	55	83	114	144	175	205	236	267	297	328	358	24
25	25	56	84	115	145	176	206	237	268	298	329	359	25
26	26	57	85	116	146	177	207	238	269	299	330	360	26
27	27	58	86	117	147	178	208	239	270	300	331	361	27
28	28	59	87	118	148	179	209	240	271	301	332	362	28
29	29		88	119	149	180	210	241	272	302	333	363	29
30	30		89	120	150	181	211	242	273	303	334	364	30
31	31		90		151		212	243		304		365	31

*A leap year is any year whose number is exactly divisible by 4, except century years, which are leap years only if exactly divisible by 400.

Leap years from 2004 to 2050:

2004	2008	2012	2016
2020	2024	2028	2032
2036	2040	2044	2048

The Julian Calendar for Leap years is provided by adding 1 to all values starting with March 1, in the above table; and by assigning 60 to February 29.

Blood Serum Chemistry - Normal Values

Constituent	Typical Normal Range
Electrolytes	
Bicarbonate (total)	18-30 mEq/L
Calcium (total)	9-11 mg/dL; 4.5-5.5 mEq/L
Chloride	98-106 mEq/L
Magnesium	1.8-3.6 mg/dL; 1.5-3.0 mEq/L
Phosphorus	3-4.5 mg/dL; 1.8-2.3 mEq/L (adults)
	4-6.5 mg/dL; 2.3-3.8 mEq/L (children)
Potassium	3.5-5.5 mEq/L
Sodium	135-147 mEq/L
Enzymes*	
Alkaline Phosphatase	50-160 U/L
Amylase	53-123 U/L
Creatine Kinase (CK, CPK)	38-174 U/L (males)
	96-140 U/L (females)
Lipase	10-150 U/L
ALT (GPT)	0-30 U/L
AST (GOT)	0-40 U/L
Other	
Albumin	3.5-5.5 g/dL
Bilirubin	<1.0 mg/dL total
	<0.4 mg/dL direct (glucuronide- or sulfate-conjugated)
Cholesterol	<225 mg/dL (depends on age)
Creatinine	1.0-2.0 mg/dL
Globulin	1.5-3.5 g/dL
Glucose	80-120 mg/dL
Protein (Total)	6.3-8.0 g/dL
Triglycerides	40-200 mg/dL
Urea	20-40 mg/dL
Uric Acid	2.0-4.0 mg/dL

Notes: The normal ranges in each laboratory depend on the local population, test methodology and conditions of assay, units, and a variety of additional circumstances. * The units for enzyme activities are especially sensitive to such circumstances. The normal ranges above are typical, but the normal ranges established for each laboratory should be used for most purposes. The units g/dL (grams per deciliter) and mg/dL are sometimes expressed as g% and mg%, or g/100 mL and mg/100 mL.

Blood Hematology - Normal Values

Measure (abbreviations, synonyms)	Typical Normal Range	
Whole Blood		
Hematocrit (HCT; packed cell volume)	38-54% (men) 36-47% (women)	
Hemoglobin (Hb)	14-18 g/dL (men) 12-16 g/dL (women) 12-14 g/dL (children) 14.5-24.5 g/dL (newborns)	
Complete Blood Count (CBC)	**per mm^3**	**percentage**
Erythrocytes (Red blood cells; RBCs)	4.5-6 x10^4 (men) 4.3-5.5x10^4 (women)	
Reticulocytes		0-1% of RBCs
Leukocytes (total)	5000-10000	
Myelocytes	0	0% of leukocytes
Juvenile neutrophils	0-100	0-1%
Band neutrophils	0-500	0-5%
Segmented neutrophils	2500-6000	40-60%
Lymphocytes	1000-4000	20-40%
Eosinophils	50-300	0-5%
Basophils	0-100	0-1%
Monocytes	200-800	4-8%
Platelets	200,000-500,000	
RBC Measurements		
Diameter	5.5-8.8 µm	
Mean corpuscular volume (MCV)	80-94 $µm^3$	
Mean corpuscular hemoglobin (MCH)	27-32 pg	
Mean corpuscular hemoglobin concentration	33.4-35.5 g/dL	
Miscellaneous		
Prothrombin time (PT)	10-20 seconds	0.8-1.2 INR (International Normalized Ratio)
Activated Partial Thromboplastin Time (aPTT)	30-45 seconds	

Notes: The normal ranges in each laboratory depend on the local population, test methodology and conditions of assay, units, and a variety of other circumstances. The ranges above are typical, but the normal values established for each laboratory should be used for most purposes. Normal ranges for newborns often vary from the adult ranges.

CONVERSION TABLES

To convert From	To	Multiply By	To convert From	To	Multiply By
Length			Length		
mm	inches	.03937	inches	mm	25.40
cm	inches	.3937	inches	cm	2.540
meters	inches	39.37	inches	meters	.0254
meters	feet	3.281	feet	meters	.3048
meters	yards	1.0936	feet	km	.0003048
km	feet	3230.84	yards	meters	.9144
Area			Area		
sq mm	sq inches	.00155	sq inches	sq mm	645.2
sq cm	sq inches	.155	sq inches	sq cm	6.452
sq meters	sq feet	10.764	sq feet	sq meters	.09290
sq meters	sq yards	1.196	sq yards	sq meters	.8361
sq km	sq miles	.3861	sq miles	sq km	2.590
hectares	acres	2.471	acres	hectares	.4047
Volume			Volume		
cu cm	cu inches	.06102	cu inches	cu cm	16.387
cu cm	fl ounces	.03381	cu inches	liters	.01639
cu meters	cu feet	35.314	cu feet	cu meters	.02832
cu meters	cu yards	1.308	cu feet	liters	28.317
cu meters	US gal	264.2	cu yards	cu meters	.7646
liters	cu inches	61.023	fl ounces	ml	29.57
liters	cu feet	.03531	US gal	cu meters	.003785
liters	US gal	.2642	US gal	liters	3.785
Weight			Weight		
grams	grains	15.432	grains	grams	.0648
grams	ounces*	.0353	ounces*	grams	28.350
kg	ounces*	35.27	ounces*	kg	.02835
kg	pounds	2.2046	pounds*	kg	.4536
kg	US tons	.001102	pounds*	metric tons	.000454
kg	long tons	.000984	US tons	kg	907.2
metric tons	pounds	2204.6	US tons	metric tons	.9072
metric tons	US tons	1.1023	long tons	kg	1016.
metric tons	long tons	.9842	long tons	metric tons	1.0160
Unit Weight			Unit Weight		
gr/sq cm	lb/sq in	.01422	lb/ft	kg/m	1.4881
gr/cu cm	lb/cu in	.0361	lb/sq in	gr/sq cm	70.31
kg/sq cm	lb/sq in	14.22	lb/sq in	kg/sq cm	.07031
kg/cu m	lb/cu ft	.0624	lb/cu in	gr/cu cm	27.68
kg/m	lb/ft	.6720	lb/cu ft	kg/cu m	16.018
Unit Volume			Unit Volume		
liters/min	US gpm	.2642	US gpm	liters/min	3.785
liters/min	cfm	.03531	US gpm	liters/hr	237.1
liters/hr	US gpm	.0044	US gpm	cu m/hr	.2371
cu m/min	cfm	35.314	cfm	liters/min	26.317
cu m/hr	cfm	.5886	cfm	cu m/min	.02832
cu m/hr	US gpm	4.4028	cfm	cu m/hr	1.6992
Power			Power		
watts	ft-lb/sec	.7376	ft-lb/sec	watts	1.365
watts	hp	.00134	hp	watts	745.7
kw	hp	1.3410	hp	kw	.7457
cheval-vap	hp	.9863	hp	cheval-vap	1.0139
Heat			Heat		
gr-cal	Btu	.003969	Btu	gr-cal	252.
kg/cal	Btu	3.9693	Btu	kg/cal	.252
kg-cal/kg	Btu/lb	1.800	Btu/lb	kg-cal/kg	.5556
gr-cal/sq cm	Btu/sq ft	3.687	Btu/sq ft	gr-cal/sq cm	.2713
kg-cal/cu m	Btu/cu ft	.1124	Btu/cu ft		
	kg-cal/cu m	8.899			

CONVERSION TABLES

To convert From	To	Multiply By	To convert From	To	Multiply By
Work/Energy			Work/Energy		
joule	ft-lb	.7376	ft-lb	joule	1.356
meter-kg	ft-lb	7.2330	ft-lb	meter-kg	.1383
gr-cal	ft-lb	3.067	ft-lb	gr-cal	.3239
kg-cal	ft-lb	3067	ft-lb	kg-cal	.0003239
hp-hr	ft-lb	1,980,000	ft-lb	hp-hr	5.051 x 10
kwhr	ft-lb	2,650,000	ft-lb	kwhr	3.766 x 10
Btu	ft-lb	778.	ft-lb	Btu	.0012856

Conversion Factors

CONVERSION FACTORS

TEMPERATURE: If F and C denote readings on the Fahrenheit and centigrade standard scales, respectively, for the same, then

$C = 5/9^* (F - 32)$ $F = (9/5)^* C + 32$

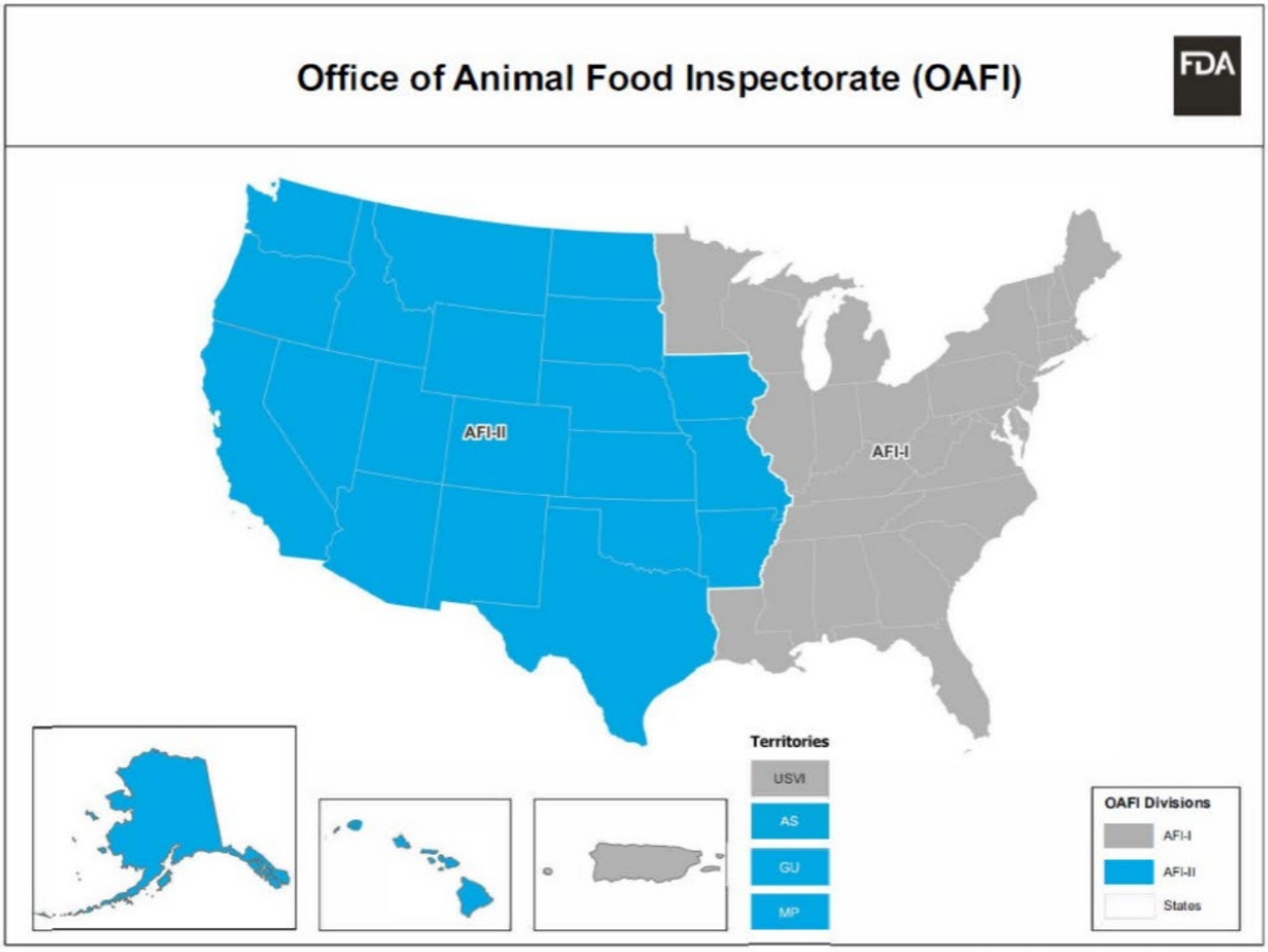
Some common reference points are: 0°C = 32°F
22°C = 71.6°F
37°C = 98.6°F
100°C = 212°F.

CONVERSION TABLE FOR MEDICATED FEEDS:

1 Pound = 453.6 Grams
1 Gram = 0.0022 Pounds
1 Gram = 1,000 Milligrams
1 Gram = 1,000,000 Micrograms
1 Kilogram = 1,000 Grams
1 Kilogram = 2.205 Pounds
1 Milligram = 0.001 Grams
1 Milligram = 1,000 Micrograms
1 Microgram = 0.001 Milligrams
1 Microgram Per Gram = 1 Part Per Million
1 Part Per Million (ppm) = 0.454 mg/lb.
1 Part Per Million (ppm) = 0.907 Grams Per Ton

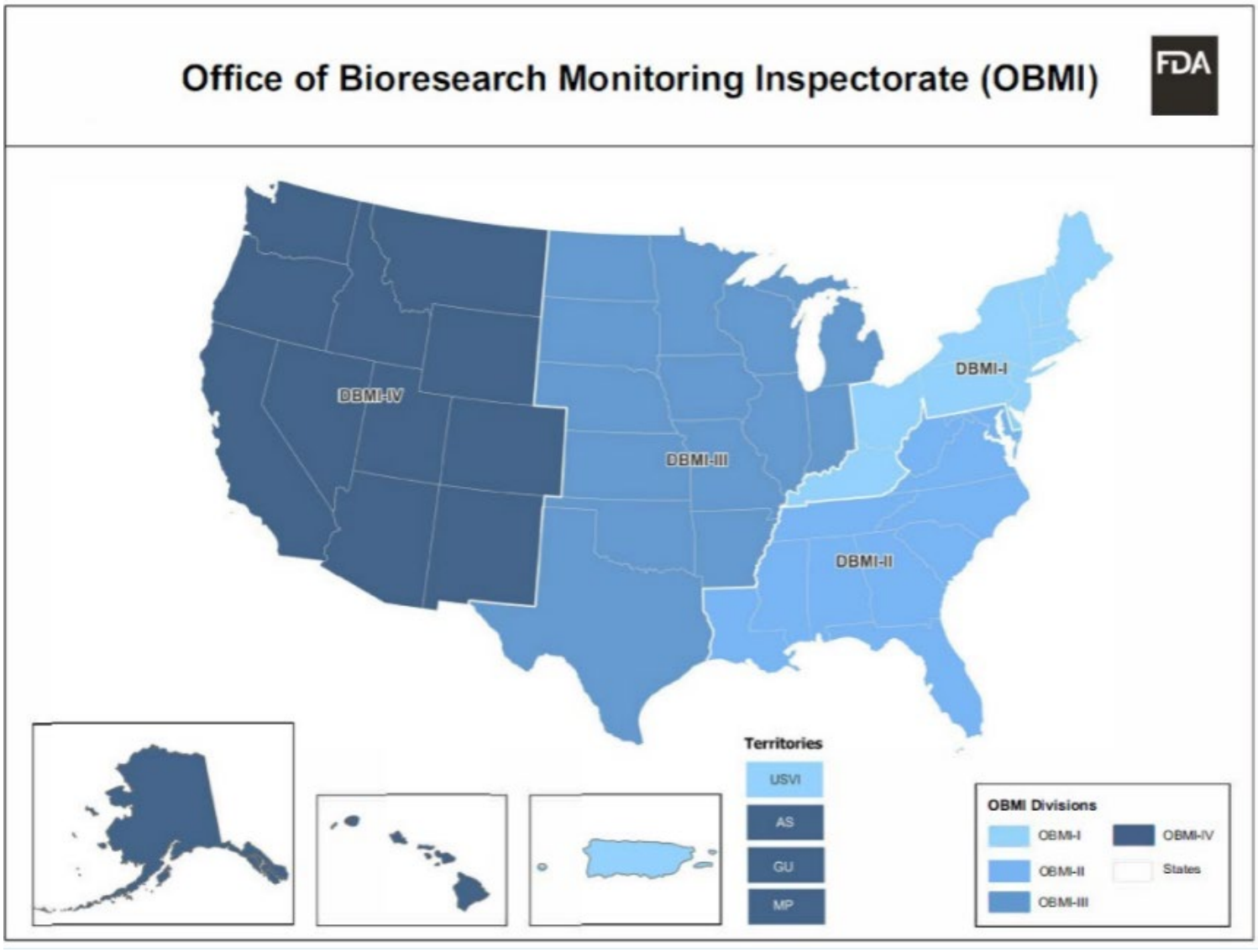
HOUSEHOLD MEASURES:

1 teaspoon (tsp) = 5cc = 1 fl dram
1 dessertspoon = 8cc = 2 fl drams
1 tablespoon (tbsp) = 15cc = 1/2 fl ounce
1 teacup = 120cc = 4 fl ounces
1 tumbler = 240cc = 8 fl ounces = 1/2 pint
8 pints = 4 quarts = 1 gallon = 128 fluid ounces



OAFI Division 1					
Alabama	Connecticut	District of Columbia	Delaware	Florida	Georgia
Illinois	Indiana	Kentucky	Louisiana	Maine	Maryland
Massachusetts	Michigan	Minnesota	Mississippi	New Hampshire	New Jersey
New York	North Carolina	Ohio	Pennsylvania	Puerto Rico	Rhode Island
South Carolina	Tennessee	Vermont	Virgin Islands	Virginia	West Virginia
Wisconsin					

OAFI Division 2				
Alaska	American Samoa	Arizona	Arkansas	California
Colorado	Guam	Hawaii	Idaho	Iowa
Kansas	Missouri	Montana	Nebraska	Nevada
New Mexico	North Dakota	Northern Mariana Islands	Oklahoma	Oregon
South Dakota	Texas	Utah	Washington	Wyoming

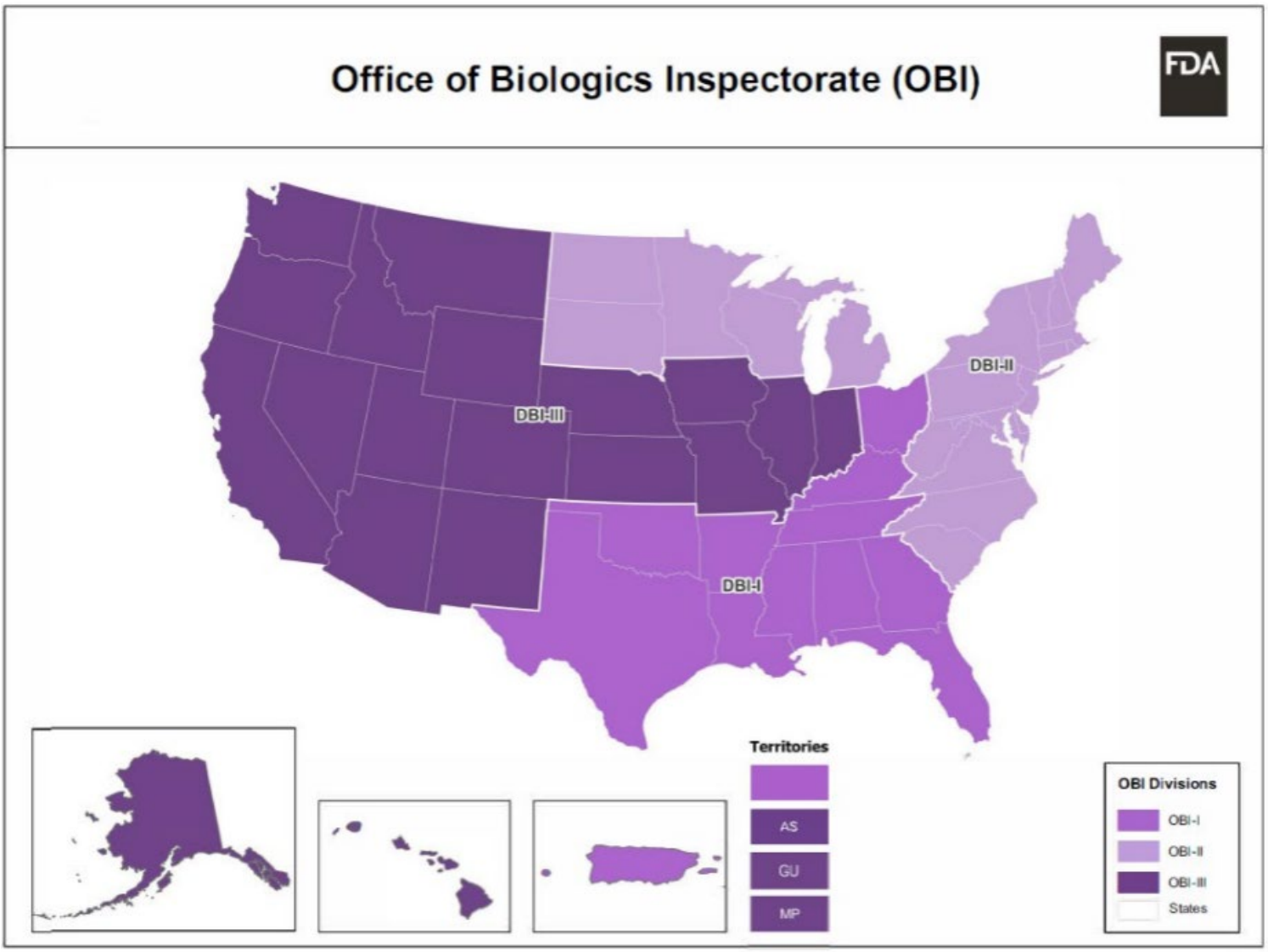


OBMI Division 1						
Connecticut	Delaware	Kentucky	Maine	Massachusetts	New Hampshire	Puerto Rico
New Jersey	New York	Ohio	Pennsylvania	Rhode Island	Vermont	Virgin Islands

OBMI Division 2					
Alabama	District of Columbia	Florida	Georgia	Maryland	Mississippi
North Carolina	Louisiana	South Carolina	Tennessee	Virginia	West Virginia

OBMI Division 3						
Arkansas	Illinois	Indiana	Iowa	Kansas	Michigan	Minnesota
Missouri	Nebraska	North Dakota	Oklahoma	South Dakota	Texas	Wisconsin

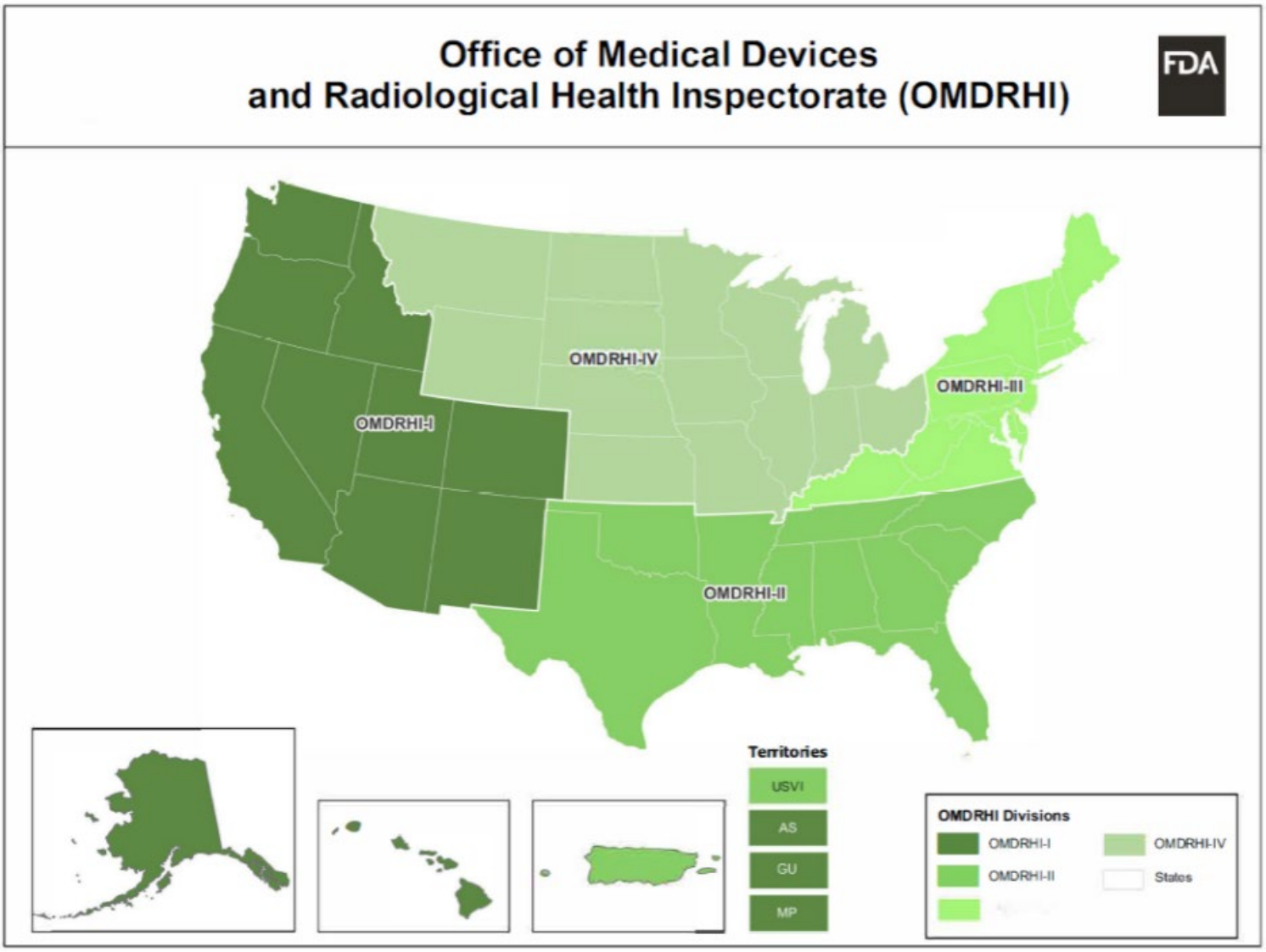
OBMI Division 4							
Alaska	American Samoa	Arizona	California	Colorado	Guam	Hawaii	Idaho
Montana	Nevada	New Mexico	Northern Mariana Islands	Oregon	Utah	Washington	Wyoming



OBI Division 1						
Alabama	Arkansas	Florida	Georgia	Kentucky	Louisiana	Mississippi
Ohio	Oklahoma	Puerto Rico	Tennessee	Texas	Virgin Islands	

OBI Division 2						
Connecticut	Delaware	District of Columbia	Maine	Maryland	Massachusetts	Michigan
Minnesota	North Carolina	North Dakota	Pennsylvania	Rhode Island	South Carolina	South Dakota
Vermont	Virginia	New Hampshire	New Jersey	New York	West Virginia	Wisconsin

OBI Division 3							
Alaska	American Samoa	Arizona	California	Colorado	Guam	Hawaii	Idaho
Illinois	Indiana	Iowa	Kansas	Missouri	Montana	Nebraska	Nevada
New Mexico	Northern Mariana Islands	Oregon	Utah	Washington	Wyoming		

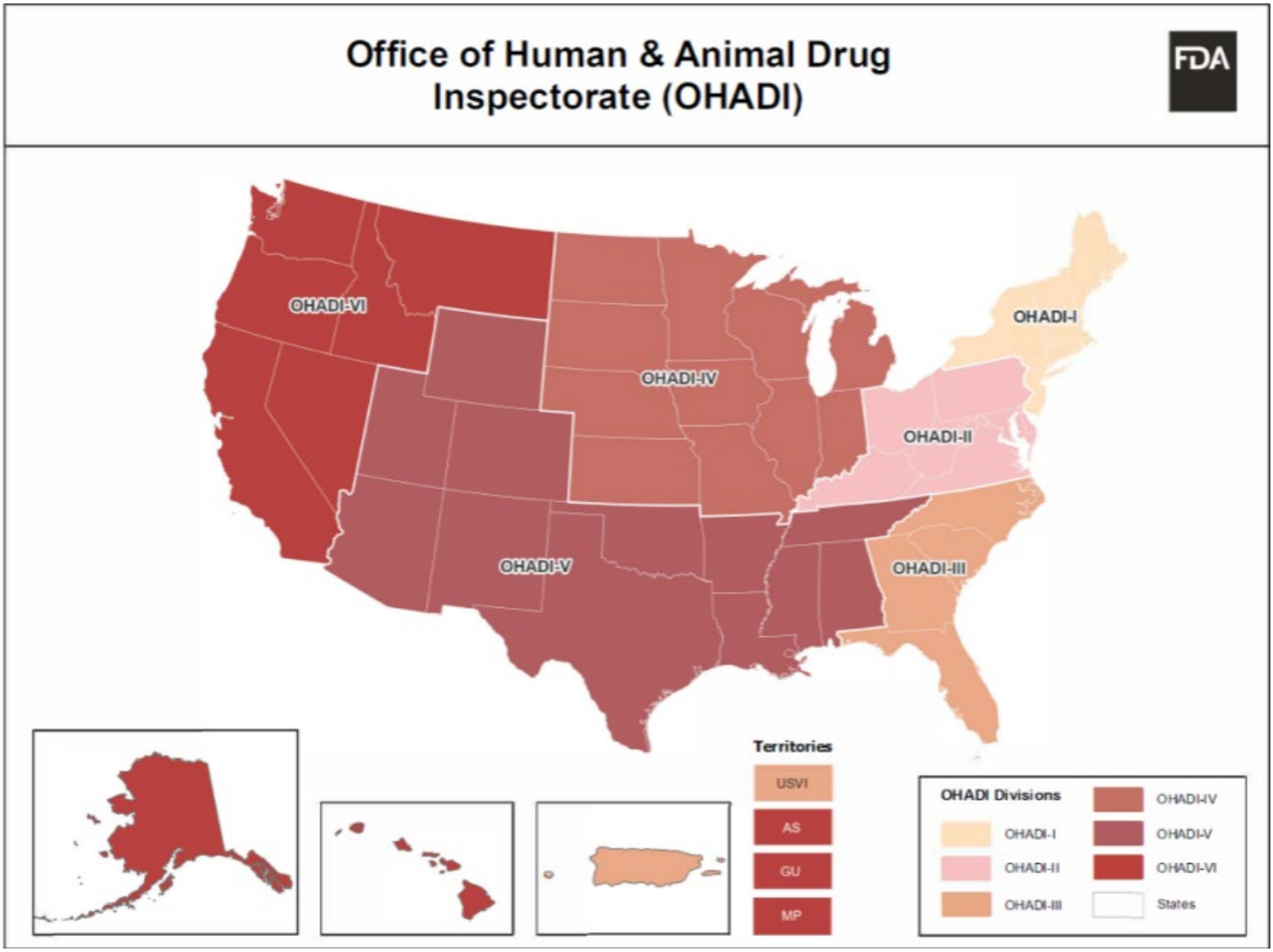


OMDRHI Division 1						
Alaska	American Samoa	Arizona	California	Colorado	Guam	Hawaii
Idaho	Nevada	New Mexico	Northern Mariana Islands	Oregon	Utah	Washington

OMDRHI Division 2						
Alabama	Arkansas	Florida	Georgia	Oklahoma	Puerto Rico	South Carolina
Tennessee	Louisiana	Mississippi	North Carolina	Texas	Virgin Islands	

OMDRHI Division 3							
Connecticut	Delaware	District of Columbia	Kentucky	Maine	Maryland	Massachusetts	New Hampshire
New Jersey	New York	Pennsylvania	Rhode Island	Vermont	Virginia	West Virginia	

OMDRHI Division 4						
Illinois	Indiana	Iowa	Kansas	Michigan	Minnesota	Missouri
Montana	Nebraska	North Dakota	Ohio	South Dakota	Wisconsin	Wyoming



OHADI Division 1							
Connecticut	Maine	Massachusetts	New Hampshire	New Jersey	New York	Rhode Island	Vermont

OHADI Division 2							
Delaware	District of Columbia	Kentucky	Maryland	Ohio	Pennsylvania	Virginia	West Virginia

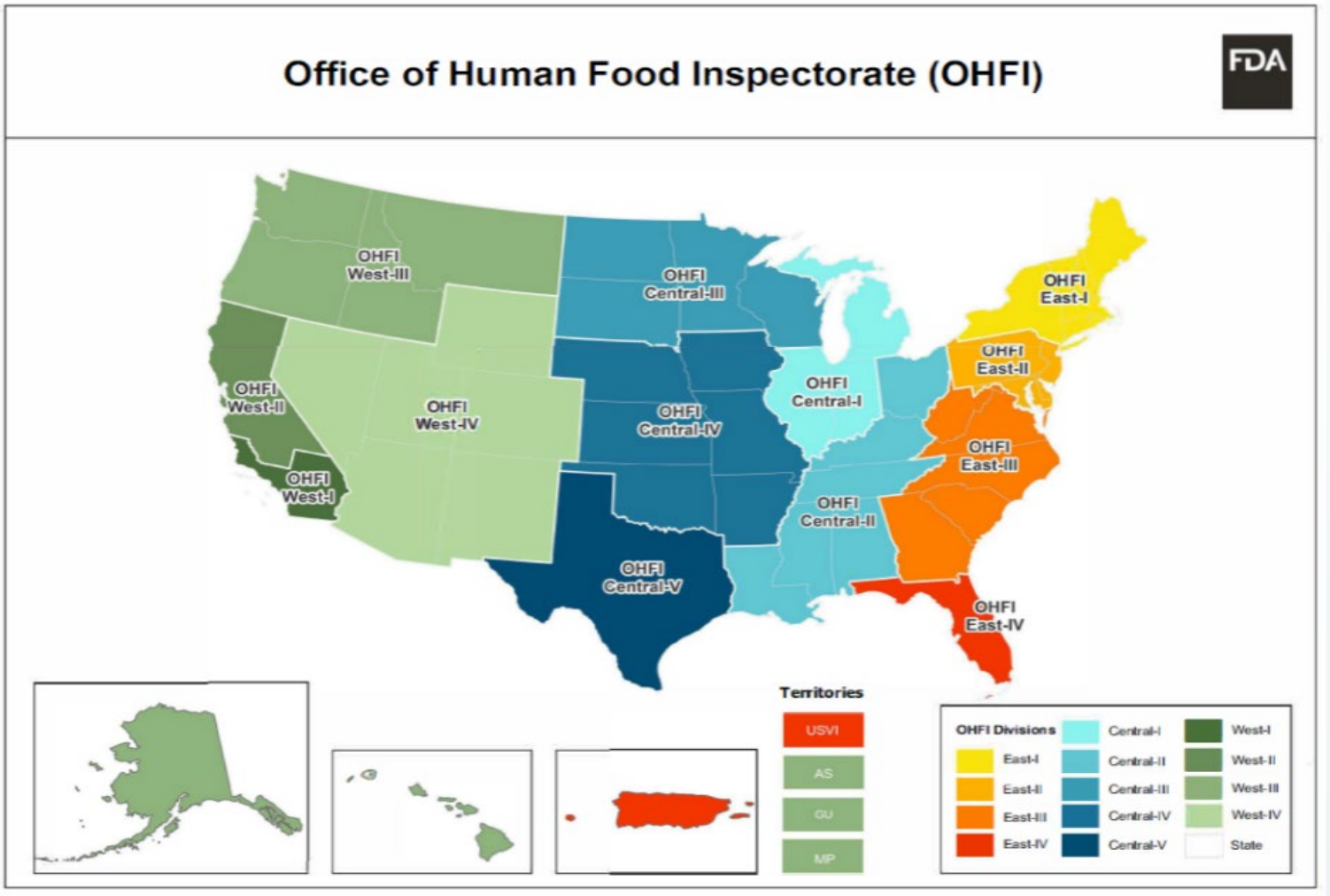
OHADI Division 3					
Florida	Georgia	North Carolina	Puerto Rico	South Carolina	Virgin Islands

OHADI Division 4					
Illinois	Indiana	Iowa	Kansas	Michigan	Minnesota
Missouri	Nebraska	North Dakota	South Dakota	Wisconsin	

OHADI Division 5					
Alabama	Arizona	Arkansas	Colorado	Louisiana	Mississippi
New Mexico	Oklahoma	Tennessee	Texas	Utah	Wyoming

OHADI Division 6					
Alaska	American Samoa	California	Guam	Hawaii	Idaho

Montana	Nevada	Northern Mariana Islands	Oregon	Washington	

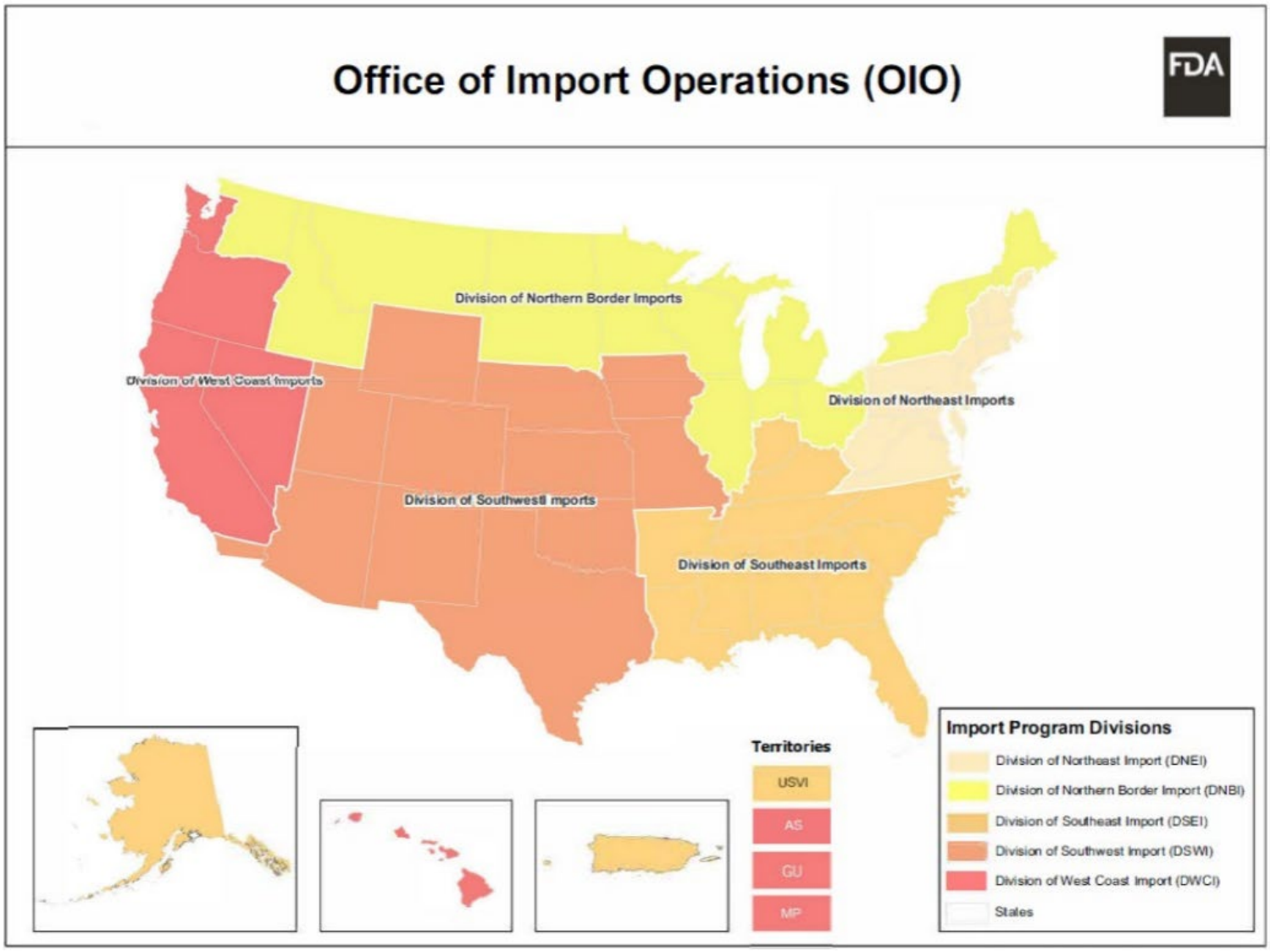


OHAFI East Division 1	OHFI East Division 2	OHFI East Division 3	OHFI East Division 4
Connecticut	Delaware	Georgia	Florida
Maine	District of Columbia	North Carolina	Puerto Rico
Massachusetts	Maryland	South Carolina	Virgin Islands
New Hampshire	New Jersey	Virginia	
New York	Pennsylvania	West Virginia	
Rhode Island			
Vermon			

OHFI Central Division 1	OHFI Central Division 2	OHFI Central Division 3	OHFI Central Division 4	OHFI Central Division 5
Illinois	Alabama	Minnesota	Arkansas	Texas
Indiana	Kentucky	North Dakota	Iowa	
Michigan	Louisiana	South Dakota	Kansas	
	Mississippi	Wisconsin	Missouri	
	Ohio		Nebraska	
	Tennessee		Oklahoma	

OHFI West Division 1	OHFI West Division 2	OHFI West Division 3	OHFI West Division4
Southern California	Northern California	Alaska	Arizona
		American Samoa	Colorado

		Guam	Nevada
		Hawaii	New Mexico
		Idaho	Utah
		Montana	Wyoming



Division of Northeast Imports						
Connecticut	District of Columbia	Delaware	Massachusetts	Maryland	Maine	New York
New Hampshire	Pennsylvania	Rhode Island	Virginia	Vermont	West Virginia	

Division of Northern Border Imports							
Idaho	Illinois	Indiana	Maine	Michigan	Minnesota	Montana	New Hampshire
New York	North Dakota	Ohio	South Dakota	Vermont	Washington	Wisconsin	

Division of Southeast Imports						
Alaska	Alabama	Arkansas	Florida	Georgia	Indiana	Kentucky
Louisiana	Mississippi	North Carolina	Puerto Rico	South Carolina	Tennessee	

Division of Southwest Imports					
Arizona	Colorado	Iowa	Kansas	Missouri	Nebraska

New Mexico	Oklahoma	Texas	Utah	Wyoming	

Division of West Coast Imports				
American Samoa	California	Guam	Hawaii	Nevada
Northern Pacific Islands	Oregon	Saipan	Washington	

Division of Tobacco Inspectorate (DTI)

Division of Tobacco Inspectorate
All U.S. States and Territories