



# CFSAN Analytical Product Survey (APS)

How innovating in the Cloud helps FDA expand data capacity and inform signal detection

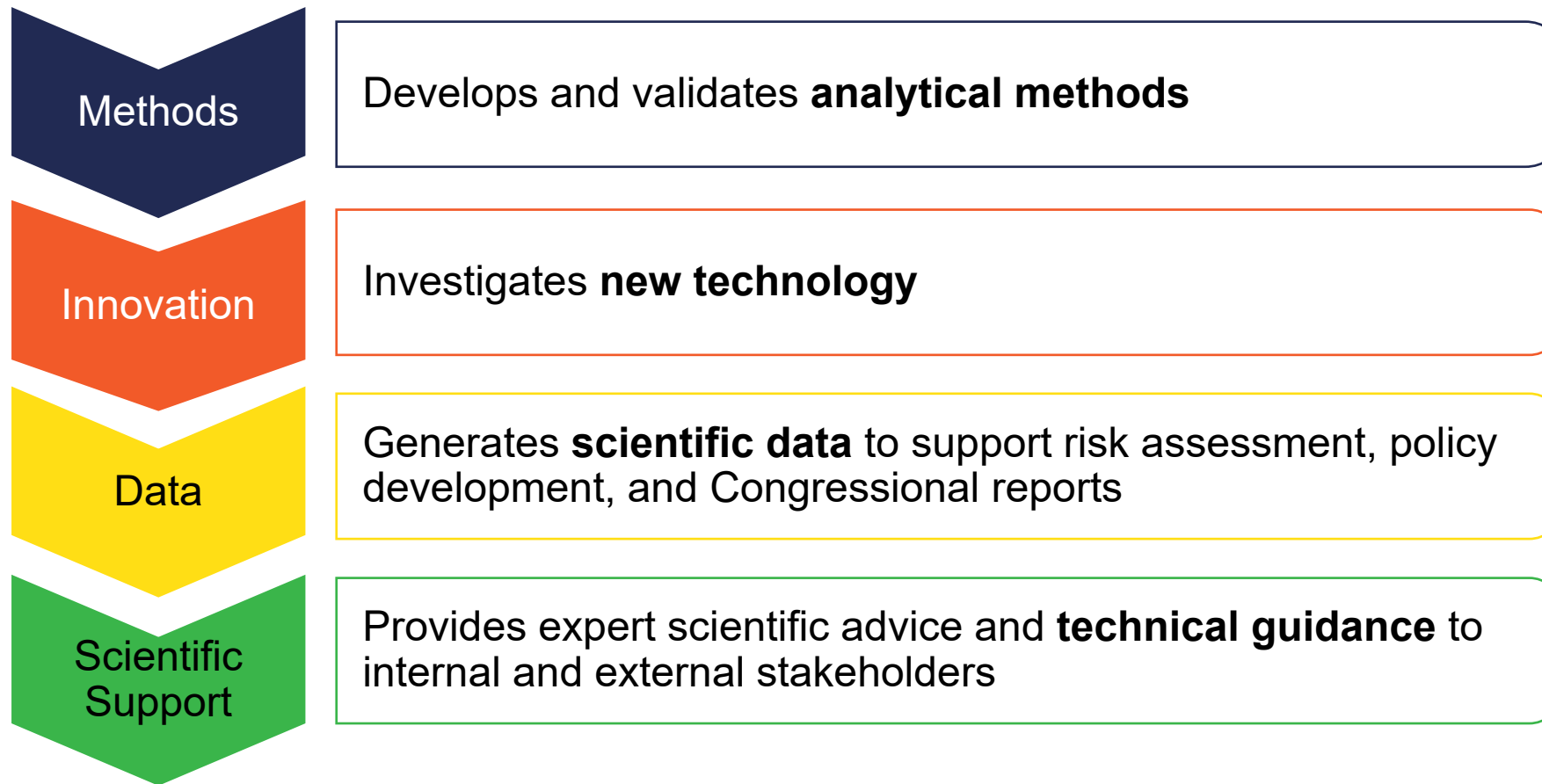
Christine Parker - Office of Regulatory Science (ORS),  
Bioanalytical Methods Branch (BMB)

Thomas Farrell – Office of Management (OM), Scientific  
Innovation and Infrastructure Branch (SIB)

# Office of Regulatory Science



- The Center for Food Safety and Applied Nutrition, Office of Regulatory Science manages a cohesive research program.



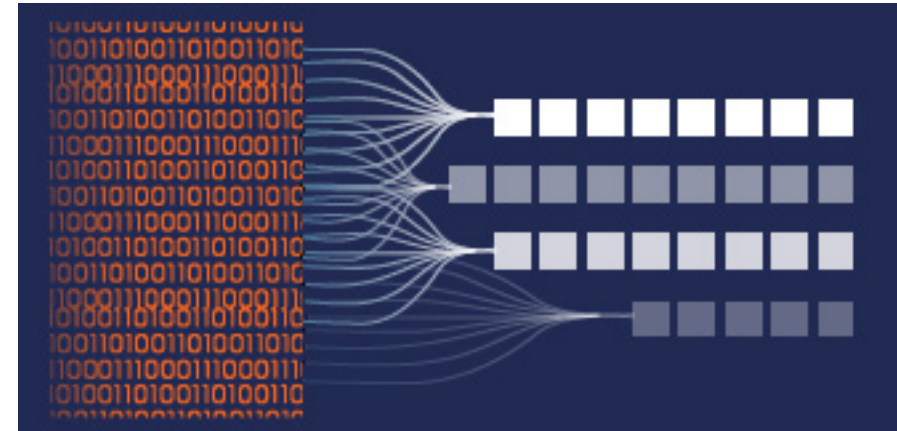
# A Solution for Data Management



- CFSAN Analytical Product Survey (APS) is an internal relational database developed to manage analytical survey data generated by FDA's Center for Food Safety and Applied Nutrition.



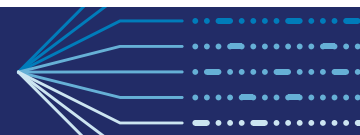
Data Acquisition



Data Curation



For feedback or to request access to the CFSAN APS database  
contact: [CFSANAPS@fda.hhs.gov](mailto:CFSANAPS@fda.hhs.gov)



# CFSAN APS: User Interface



## What data resources are provided by CFSAN APS?

The user interface offers an interactive platform with data visualizations (Dashboard), product information tables (Data View), and computational calculations (Reports) creating a customized data analysis experience.



### Dashboard

- Embedded Graphics
- Data Analytics
- Referral Levels (Flags)



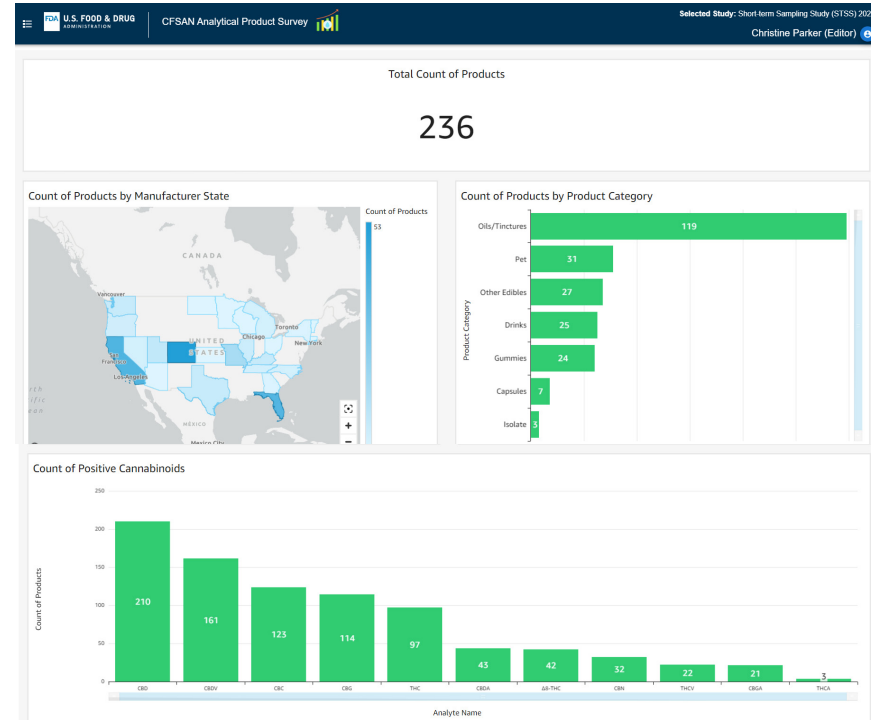
### Data View

- Product Images
- Microsoft Excel File Export
- Multi-component Filters



### Reports

- Serving Size Computations
- Percent Label Claim Calculations
- File Export for Offline Analysis



# Continuous Innovation



- CFSAN Analytical Product Survey (APS) is leveraging innovations in optical character recognition and text extraction machine learning capabilities to optimize data ingestion and downstream processing.

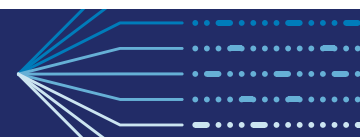


Data Extraction



Ingredient	Preferred Name	Ingredient Rank
tapioca syrup	tapioca syrup	1 of 11
beet sugar	sugar	2 of 11
fructooligosaccharides	fructooligosaccharides	3 of 11
water	water	4 of 11

Data Processing & Standardization



# Impacts from Innovation



## What are the benefits of CFSAN APS?

CFSAN APS improves communication with stakeholders, provides a platform for standardized reporting, promotes data integration and interoperability, helps to inform signal detection, and supports feasibility assessments.



**Stakeholder  
Communication**



**Standardized  
Reporting**



**Data Integration  
and Interoperability**



**Signal  
Detection**



**Feasibility  
Assessments**



# Technology Summary



# Technology Summary - WILEE



Application Hosting  
Amazon Web Services (AWS)

- CFSAN AWS East Applications Environment
- Key Services: AWS RDS.S3, OpenSearch, EKS



Front End Development  
Django

- Free and open-source
- Python-based web framework
- Embedded BI interfaces



Data Analytics & AI/ML  
Domino Data Labs & Amazon  
Sagemaker

- Machine learning and predictive analytics
- Sentiment Analysis
- Anomaly Detection



Data Visualization  
Qlik

- Development Collaboration
- Data Integration and Preparation
- Data Discovery & Robust Scalability





# Technology Summary – CAPS



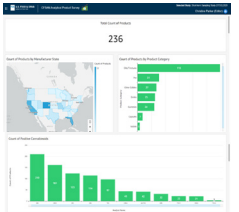
Application Hosting  
Modern cloud native serverless stack in Amazon Web Services (AWS)

- Minimal operational costs, fraction of penny per web request
- AWS RDS, S3, API Gateway, Lambda, DynamoDB



Front End Development  
Vue.js JavaScript Framework

- Will run on any modern web browser (cross platform / device)
- Enables reusable components throughout the application
- Leverages Google material design specifications



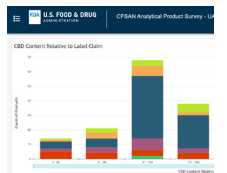
Retrieve data from RDS and DynamoDB  
AWS Lambda

- AWS Lambda functions for Data Handler, Metadata Handler, Dashboard Handler, and Survey Handler



Data Visualization  
Amazon Quicksight

- Serverless architecture that automatically scales
- Directly connect to and import data
- SPICE (super-fast, parallel, in-memory calculation engine)



Food Label Text Extraction  
Amazon Textract

- Reducing the manual burden of processing product label images
- Accessible from CAPS user interface
- Integration with standardized data processing engines

