The World without Livestock
About Us

“Meat Avatar” using the innovative food technology to develop our Plant-Based Meat products to be as tasty and nutritious as real meat at affordable prices.

We hope that people will enjoy their dishes with our Plant-Based Meat products, at the same time, feeling nice about their health and environmental sustainability.
KEY INGREDIENTS

- Bean
- Pea
- Rice
- Beetroot
- Carrot
- Konjac
- Shitake
- Pomegranate
- Coconut Oil
- Yeast
- Malt
- Pumpkin
Patty & Meat Ball
Supply Side West
Supply Side West

• Gummy
• Capsule
• Supplementary
• Immune
Food Ingredients 21th Century

Food Processing Industry

U.S Business model: low-cost food
• 4% gross
• 2% net profit

Large Volume / low margin
• Process adds a greater Value

Major differences between fresh and processed
• Control of handling and retail losses => what can we do with this business => make it sustainable business model

Recent yearly trends for new food products entries
(7 years data to 2018)

Blue Zones => Geographic for longevity living people in that zone
BIO TECHNOLOGY & GMO

Plant Biotechnology Timeline
- 1883: Scientists introduce a single gene into plants using Agrobacterium vectors
- 1990: Field trials show Bt cotton, a genetically modified (GM) cotton strain resistant to the cotton bollworm
- 1994: Bt cotton hits the market, becoming the first GM crop to be commercially grown
- 1999: Nearly 40 million hectares of transgenic crops are grown worldwide

Old vs. New Biotechnology
- Old:
  - a) bred best bull with best cow to improve the stock
  - b) first baker to use yeast enzymes to make bread rise and making an engineering product
- New:
  - a) flowing grain to brew beer
  - b) cross-breeding cotton, based on Gregor Mendel’s 1855 findings on heredity in peas. Takes 10 years or more

Advantages of GMO crops
- Reduced levels of inflammatory
- Gluten-free wheat
- Reduced food costs, increased global wheat rice
Non-Allergen Canteen
Diary Plant
Value Added Processing of Diary Products

Vitamin in the dairy product

Vit D
Vit B12

Sentenarian Leaf (Seaweed)

Brewer yeast
Food Processing Innovation Center
Sensory

- Clear scent
- Carbonate water
- Warm water
- Cracker
- Carrot
- Milk

Goodscents.com
Flavornet.com
Global bean & Pulse Industry

Symbiotic Nitrogen Fixation (SNF)
rhizobia bacteria => ดึง N2 จาก อากาศ

“Kidney Bean” *****

Production
Storage and Handling => water will effect
Physiological Properties

Nutritional Enhancement

Process Modification
Thermal inactivation:

Extraction / Concentration
• Air Classification
• Aqueous
• Membrane

Value-added Processing
Packing
Canning

Precooked Products (60%)
• Pin Milled
• Air Classified
• Fractions (Protein, Starch, Fiber)

Milled flours Concentrates (90%)
• Wet Extraction
• Ultra filtration Isoelectric ppt
• Protein Isolates

Protein Hydrolysis
Packaging

Design the right packaging for the right product. To preserve the environment (trade off between advance).
Innovative Food Ingredient Trends for Product Development

Current Trend

• Cut Sodium
• Low Sugar
• Gluten Free
• High Fiber Food
Innovative Food Ingredient Trends for Product Development

Salt
• metallic notes
• effect to texture: processed meat (extract meat protein from meat muscle), bread

How to lower salts content
• High purification & crystalline structure of NaCl (*lower density salt flack with greater surface area 33% reduction)
• Salt microspheres (20-25% Na reduction)
• Sea salt-reduce Na by Replacing it with other minerals K, Mg, Ca

Sodium Reduction Principles
• Wide range of salt replacers but the cost!!
• Taste modifiers
• ***Trick the sensory
Innovative Food Ingredient Trends for Product Development

Popular Option
• NaCl + KCl => 30-50% but bitter note / metallic note
• enchanting flavor
  • garlic, onion
  • low concentration of vinegar / citric
  • Dairy (whey or milk) permeates => calcium increase salty taste
  • Smoky note also help
• Umami
  • “Savory” (not salty) taste of broken down proteins (small peptides & amino acids) and nucleotides (Hydrolyze Proteins)
  • Naturally
    • cheese, meat, fish => protein
    • seaweed, tomatoes, mushrooms => high in glutamate
    • yeast extracts: => Cell => DNA => nucleotides
• “Toolbox” approach
  • KCl combine with other ingredients e.g. yeast extract about 20-30%
What harm people? NaCl or Salty taste
Innovative Food Ingredient Trends for Product Development

**Sugars & Sweeteners**
- Develop color
- Texture or mouth feel
- Moisture retention
- Control Aw: shelf life, safety

Alternative sweetener
Sugar = Sucrose

Sugar replacement concern about Sweetness Equivalence (compare to sugar = 1 index) / Calories / Solubility / Glycemic Index

Monosaccharides e.g. Glucose, Gruuctose
Disaccharides e.g. Sucrose (sugar cane), Maltose,
Oligosaccharides e.g. Maltodextrins, Inulin

*** Polyols (Alcohol of sugar) e.g Xylitol, Sorbitol => sweet as sugar, low cal, but cool sense
Innovative Food Ingredient Trends for Product Development

HIS (High intensity sweetener)

Issues with
• Slow onset or longer linger
• Sugar is very quick gone sweet taste

Sweet Proteins (sweeter than sugar, heat & pH stable, no bitter aftertaste, GI = 0, water soluble)
Brazzein
Thaumatin
Monellin

Sweet Modifiers
Innovative Food Ingredient Trends for Product Development

Gluten & Gluten-free
2 Proteins (Gliadins, Glutenins)

Gluten free product
• Processing: machinability
• Taste, Texture & Appearance: Dry
• Shelf Life: shorter
• Nutritional profile:

Gluten Free Solutions
• Eggs => Elasticity, binding agent, thickening, Lecithin as emulsification
• Starch / Rice flour => Viscosity contributor but have to use with Pre-gelatinized starches,
• Hydrocolloids: Gums (Guar, locust bean, xathan), TIC Gum, Chia and flax have natural gums
• Fibers
• Fats and Emulsifiers
• Enzymes
• Grains: flax, quinoa, chai, buckwheat
Innovative Food Ingredient Trends for Product Development

Fiber & Fiber addition

Macro sources: Cellulose, hemicellulose, mucilages,
Function
• Fat reduction
• Water holding Capacity
• Rheological properties (viscosity)
• Aiding in extrusion
• Dimensional stabilizer
• Texturisingagaent
• Gelling agent
• Prebiotics (Inulin, Oligofructose)
Food Safety

CRIS.msu.edu

The Center for Research on Ingredient Safety at Michigan State University (CRIS) is one of the few organizations in the world willing to tackle the hard questions about ingredient safety in our everyday products.

Become a partner  Connect with CRIS

There are no entries at this time.
Market Visit
Friendship / Networking / Connections