Product Development and Food Safety

Issues For Farms

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Ag in Uncertain Times

Value-Added Foods

- Local, organic, vine-ripened, or specialty crops
- "Gourmet" foods
  - Jams, jellies, preserves
  - Pickled vegetables
  - Hot sauces, salsas, tapenades
  - Herbed oils and vinegars
- Must consider regulatory, safety and labeling issues

Processed vs. Unprocessed Produce

- Farms with >$25,000 total produce sales must comply with FDA rules
- “Standards for the Growing, Harvesting, Packing, and Holding of Produce for Human Consumption”
- Additional State regulations may apply to unprocessed produce registration
- Processed produce must be prepared in an inspected kitchen or facility

Processed Foods May Include:

Peeled, Cut, or Washed Produce

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Processed Foods May Include:
Cut Leafy Greens

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Processed Foods May Include:
Dried or Dehydrated Produce

Processing Options:

- Cottage Kitchen
  - Most states have formalized Cottage rules
  - No FDA registration required, but limited options
- Certified Commercial Facilities
  - State or County-inspected kitchen
  - FDA Registration and FSMA compliance required
- Contract Packagers (Co-Packers)
  - Make & package your product in their down-time
  - FDA Registration and FSMA compliance required

FSMA Exemptions for small farms

- "Current Good Manufacturing Practice, Hazard Analysis, and Risk-Based Preventive Controls for Human Food"
- Farms with < $1mil in total food sales exempt from certain record keeping requirements
  - Includes market value of food processed, packed, or held
- Examples of exempt activities
  - Harvesting (trimming, sifting, shelling, and washing)
  - Drying/Dehydrating
  - Packaging and Labeling RACs

Safety Issues to Consider

- How will you clean & sanitize?
- How will you prepare or cook your product to minimize safety risks?
- How will you package/protect your product?
- How will you store & display your product?
- Must consider Chemical, Physical, and Biological sources of contamination

Biological Contaminants

- Bacteria
  - Multiply and grow without a host
  - *Salmonella*, *E. coli*, *Listeria*
- Viruses
  - Must infect a living host cell before reproducing, but can survive without a host
  - Norwalk-type viruses, Hepatitis A
- Fungi
  - Multiply and grow without a host
  - Mold and yeast

Bacterial Growth & Survival

Food

Acid

Temperature

Time

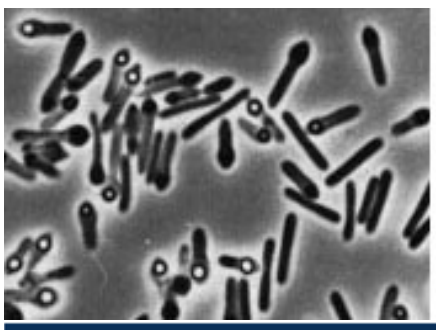
Oxygen

Moisture

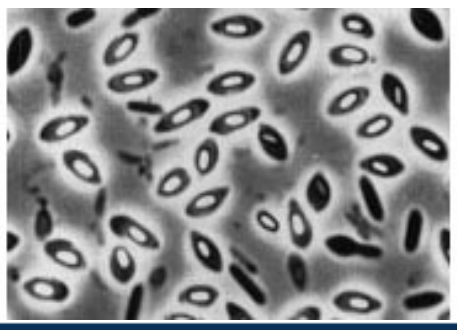
Acidity

- Acid slows the growth of some bacteria
- Acid prevents germination of bacterial spores
- Vinegar, citrus juices, tomatoes

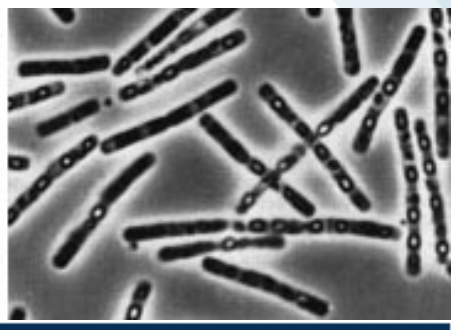
C. botulinum grows if no oxygen is present (toxin produced)



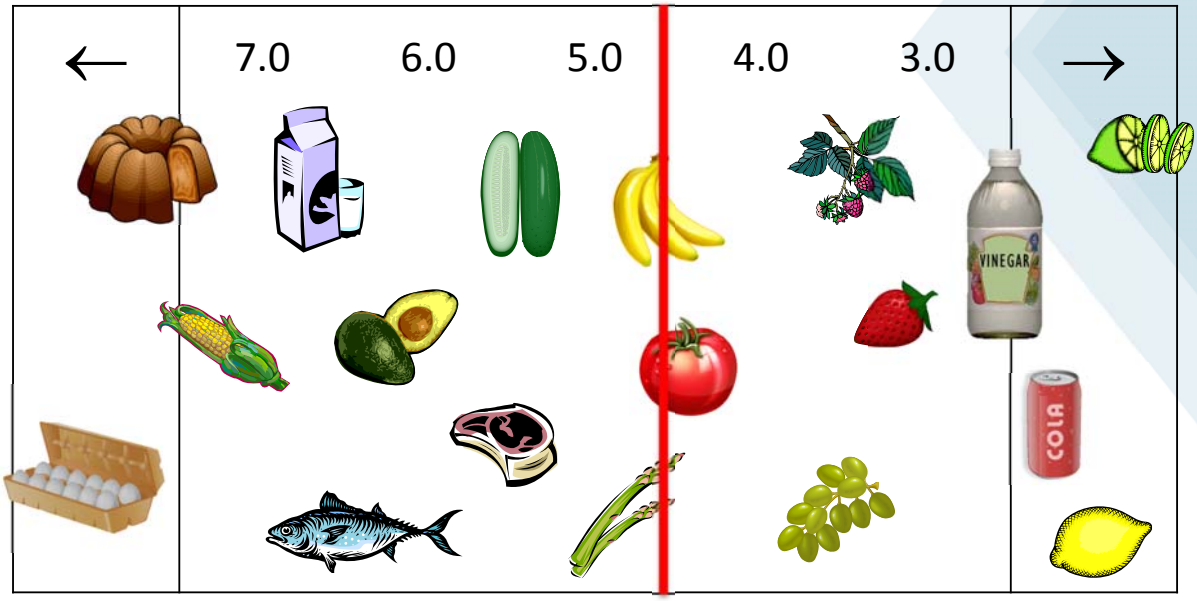
Spores form when oxygen is present (no toxin produced)



Growth resumes when oxygen is removed only if pH>4.6



Most foods are between 7.0 (neutral) and 3.0 (acidic)



Temperature

- Each bacteria prefers a different temperature range
- The temperature danger zone: 40 – 140F
- Heat can destroy bacteria, cold only preserves
- Many foods require temperature control for safety
  - Refrigeration or freezing

Moisture (Aw)

- Bacteria must have water available
- Water activity (Aw) is a measure of how much water is available, not how much is present
- Add sugar or salt to lower Aw
- Remove water to lower Aw

Water Activity (A_w)	Examples of foods in this range
1.00 – 0.95	Fresh produce & meat; canned produce & meat; milk; juice; bread
0.95 – 0.91	Cured meats (ham); semisoft & some hard cheeses (Swiss, young cheddar, provolone); moist cakes
0.91 – 0.87	Hard or aged cheese; sponge cakes; margarine; most fermented sausage
0.87 – 0.80	Syrup; flour; fruit juice concentrate; high-sugar cakes
0.80 – 0.75	Jam & marmalade; marshmallows; beef jerky
0.75 – 0.65	Soy sauce; molasses; jelly; nuts; oats; peanut butter;
0.65 – 0.60	Honey; caramels; dried fruit; toffee
0.50 or below	Spices; crackers; cookies; pasta; powdered milk

FDA – “Exempt” Products

- Refrigerated, frozen, or Aw < 0.85
- Labeling: 21CFR §101
- Processing: 21CFR §117
- Standards of Identity: 21CFR §135 to 169
- FDA Food Processor registration required

Examples of “Exempt” Products

- Candies and syrups
- Dry mixes, spices/herbs, and flavorings
- Roasted nuts
- Dehydrated fruits and vegetables
- Dried pasta and noodles
- Full-sugar jams and jellies
- Some BBQ sauces

FDA – Acid Food Regulations

- Canned or bottled foods with a natural pH < 4.6
  - "Formulated Acid" products contain no more than 10% low acid ingredients
- Labeling: 21CFR §101
- Processing: 21CFR §117
- Standards of Identity: 21CFR §135 to 169
- FDA Food Processor registration required

Examples of Acid Foods

- Canned tomatoes and tomato products
- Canned fruits
- Flavored vinegars
- Vinegar and oil dressings
- Low-sugar fruit preserves
- Fermented foods (no other acid added)

FDA – Acidified Food Regulations

- Natural pH > 4.6, but added acid drops pH
  - Require Process Authority letter & regular filings
- Labeling: 21CFR §101
- Processing: 21CFR §114
- Standards of Identity: 21CFR §135 to 169
- FDA Food Processor registration required
- FDA Acidified Food Processer registration required

Examples of Acidified Foods

- Salsa and spaghetti sauces
- Most hot sauces and BBQ sauces
- Worcestershire sauce
- Pickled vegetables
- Mayonnaise and salad dressing
- Some vegetable juice blends, Clamato juice

FDA – Low Acid Food Regulations

- Natural pH > 4.6, no acid added
  - Require Process Authority letter & regular filings
- Labeling: 21CFR §101
- Processing: 21CFR §113
- Standards of Identity: 21CFR §135 to 169
- FDA Food Processor registration required
- FDA Low Acid Food Processer registration required

Examples of Low Acid Foods

- Canned vegetables
- Canned beans and legumes
- Canned or bottled olives
- Vegetable juices
- Canned vegetarian soups and broth
- Evaporated milk
- Canned tuna, clams, and shrimp

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"Producing and Selling Value-Added Products" full curriculum available at:

http://diverseag.org/htm/farm-and-food-tourism