Product and Equipment Decisions

Getting Started

- Decisions
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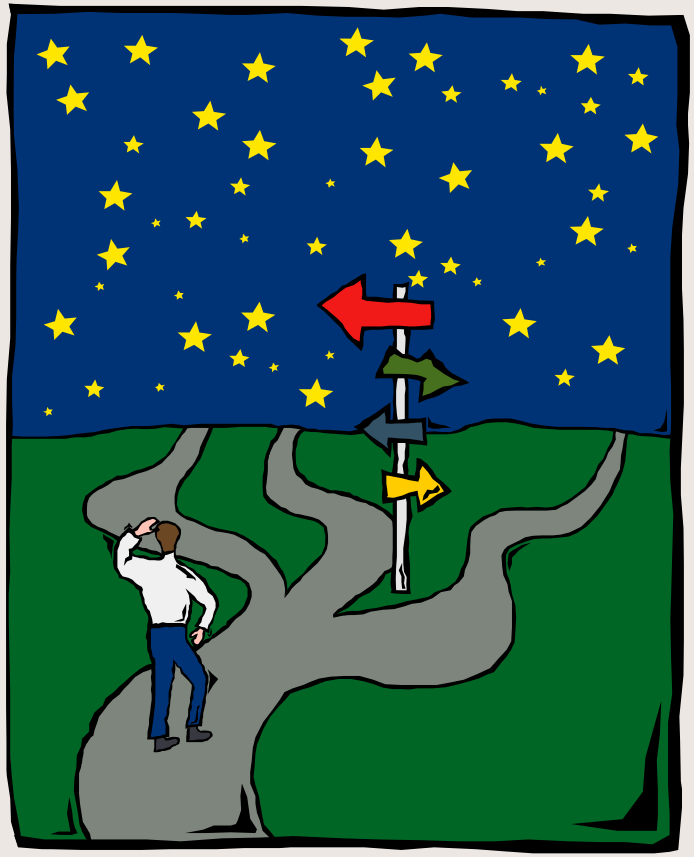

Decisions… What do I want to make?

Fluid Milk?

- Pros
  - Consumers use a lot of it & regularly.
  - Tends to drive other sales.
  - Can be inexpensive to process (raw, cream line, and “udder-run”)
  - Often provides left over cream for other products.
- Cons
  - Perishable product with limited shelf life.
  - Can be expensive to process (pasteurized, homogenized, and standardized).
  - It may be hard to differentiate yourself.

Decisions… What do I want to make?

Butter?

- Pros
  - There is a lot of demand for “homemade” butter.
  - Butter is simple to make.
  - Butter-making requires very little equipment.
  - Nice companion product with fluid milk.
- Cons
  - Packaging is time consuming – there is no simple automatic way.

Decisions… What do I want to make?

Cream Products… whipping cream, sour cream, half & half, etc?

- Pros
  - They often accompany fluid products.
  - They help use up the “extra” cream.
- Cons
  - There is a limited market – small batches may be too inefficient to produce.
  - You may not have enough “extra” cream.

Decisions… What do I want to make?

Ice Cream?

- Pros
  - Very popular product.
  - Can be a very profitable product (hand-dipped).
  - Long storage / shelf life – if kept very cold.
  - Nice companion product with fluid milk.
- Cons
  - Requires extra equipment expense.
  - Takes a lot of cream – maybe more than you have available.
  - It’s got to stay frozen!

Decisions… What do I want to make?

Cheese?

- Pros
  - There can be lots of demand… if you develop your market and you have a good product and…
  - Long shelf life – can be a balancing product.
  - May not require expensive equipment (raw milk cheese aged 60 days)
- Cons
  - You need to be a cheese maker.
  - “Everybody is doing it.”
  - Doing it right will require some expensive equipment.

Decisions… What do I want to make?

Yogurt?

- Pros
  - Simple to make.
  - Can provide the highest sales dollars per lb of raw milk.
  - There is demand for unique yogurt products.
  - Drinkable yogurt works great as a companion to fluid products.
- Cons
  - Cupped yogurt is very expensive to package – it's a Grade A product.
  - You will never come close to the "big boys" in price.

Decisions… Raw or Pasteurized?

- Raw
  - Growing demand from health-conscious consumers.
  - State-by-state regulations – research carefully.
    - Stringent quality standards
  - Much simpler plant – no pasteurizer and little other equipment needed.
  - Fewer product options – basically no manufactured products – cheese must be aged at least 60 days.

Decisions… Raw or Pasteurized?

- Pasteurized
  - Required in most states.
  - Required for manufactured products and non-fluid products.
  - Requires that expensive item called a “pasteurizer.”

Decisions… Batch pasteurization or HTST?

- Batch
  - Choose this method if you are small – the equipment costs less and there is less waste with small batches.
    - Definitely if you will process less than 4500 Lbs (500 Gal) per day.
    - Works pretty well even up to 8000 Lbs (900 Gal) per day.
    - Can work for larger operations – get ready to pay the utility bill!
  - Choose this method if you want to market a niche product: low-temperature pasteurization
  - The flavor will be different, although not offensive – let’s dispel the myth!

Decisions… Batch pasteurization or HTST?

- HTST
  - Choose this method if you are larger or plan to grow large soon – costs more to buy the equipment and watch out for wastage.
    - Pays for itself in energy savings at around 8500 lbs (1000 gal) per day.
      - Regeneration section heats up the cold milk while cooling down the hot milk.
    - Labor savings with larger batches.
      - Faster output in gallons per hour.
  - Taste should be more like customers expect.

Decisions… “Udder Run” or Standardized?

- “Udder Run”
  - The milk contains full butterfat – at whatever percentage the cows are producing.
  - Generally goes with cream-line products
  - Greatly simplifies the plant – reduces up front costs.
  - You will lose all the potential profits from selling the cream, butter, or ice cream.
    - Americans purchase milk at approximately an average 1.8% butterfat – the rest of your cream is a free byproduct.

Decisions… “Udder Run” or Standardized?

- Standardized
  - The cream level is “standardized”
    - Whole (3.25%)
    - Reduced Fat (2%)
    - Low Fat (1%)
    - Non Fat (<.5%)
  - Requires that piece of equipment called a “separator.”
  - Provides you with cream for other products.
  - The market for different levels of fat varies by consumer group.

Decisions… Cream Line or Homogenized?

- Cream Line – not homogenized
  - Various health claims are attached to cream line milk, creating a niche market
    - Remember… a niche of a niche
    - Your sales will be significantly lower
  - Requires education of consumer – many people today have no idea what cream-line even means.
    - They will probably think that the thick stuff on top means the milk is spoiled.
  - Simplifies the plant and helps to reduce start-up costs.
  - Works better with glass bottles – cream tends to stick to the neck of a plastic jug.

Decisions… Cream Line or Homogenized?

- Homogenized
  - Traditional milk – it's what consumers are used to.
  - Requires that piece of equipment called a "homogenizer."
    - Milk is forced through a valve at extreme pressures and the fat molecules are broken up and dispersed through the milk.
  - Homogenization takes place at approximately 130 degrees… part of the HTST process or done before cooling from a batch pasteurizer.

Decisions… Packaging - Glass or Plastic?

- Glass or Returnable Plastic
  - Growing consumer demand for environmentally friendly, returnable glass or plastic bottles.
  - Reduces your packaging costs dramatically. Allows you to charge more for your product.
  - You can make money on the bottle deposit.
  - Differentiates you from your competition.
  - Requires that piece of equipment called a “bottle washer” along with some extra operating costs.
  - Some stores don’t want the hassle of bottle returns – this limits your market.

Decisions… Packaging - Glass or Plastic?

- Plastic
  - Traditional milk packaging.
  - More convenient for the consumer.
  - Widest market.
    - Pits you against all other processors.
  - Less labor required to run your plant.
  - Keeps your up-front costs lower and the plant simpler.
  - Higher packaging costs – much higher for you than your larger competitors.
    - They are probably blow-molding their plastic bottles in the plant.

Decisions… How big should my plant be?

- Which end shall we start with – the cows or the consumer?
  - Cows… tells you the maximum capacity (perhaps)
    - They produce milk seven days a week. You will process ?? days a week.
    - Plan to sell some milk to the Coop in order to balance your production (unless you are going to make cheese).
  - Consumer… how big is your market?
    - At what level will you expect to start?
    - At what level do you plan to be in one year? in three years? in five years?
    - This is really the way to size your plant.

Decisions… How big should my plant be?

- How long do you want to operate your plant each day?
  - Family labor
    - Get in and get done so that you can do other things.
    - Maybe the plant is oversized to gain speed.
  - Hired labor
    - Get the most out of your investment.
    - Keep the plant efficient.

Decisions… How big should my plant be?

- HTST pasteurization
  - Smallest batch should equal 10 – 15 minutes of run time at a minimum.
  - Largest product run should not exceed 6 - 7 hours per day + cleanup.
- Batch pasteurization
  - Smallest batch should equal 1/3 of pasteurizer size
  - Largest product run should not exceed three batches per day.
- Cheese vat
  - Depending on culturing times – probably one batch per day per vat.

Decisions… How big should my plant be?

- Growth plans
  - Purchase equipment sized to accommodate the growth of the next 1 – 3 years.
  - I wouldn't recommend sizing equipment for growth beyond 3 years.
    - Your product / market / goals may change
    - Upgrade at a later time – saves interest expense
  - You might want to consider sizing the building larger and/or designing the building for expansion.

Decisions… How big should my building be?

- Plant layout is a subject all its own…
  - Remember the rooms that are easily forgotten.
    - Lab area / Office
    - Dry ingredient storage
    - Packaging storage
    - Staging area
    - Crate washing area
    - Large enough mechanical room

Decisions… How big should my building be?

- Areas in the building where space requirements mushroom…
  - Packaging Storage
  - General Storage
  - Cooler
  - Aging Room

Maybe you should plan your building to be able to expand these areas.

Decisions… How will I balance production with processing?

- Selling milk to the coop?
- Buying milk in when needed?
- Making a long shelf-life product
  - Ice Cream
  - Cheese
- Separating the milk and feeding the skim milk to the hogs?

Decisions… What energy source should I use?

- Options – think outside the box
  - Electricity
  - Fuel
  - LP Gas / Natural Gas
  - Coal

Decisions… Steam or Hot Water Boiler?

- Steam Boiler
  - It's quick to get up to temperature
  - It provides steam for air space requirements
  - It's expensive to install
    - The boiler is expensive
    - The piping is expensive
  - It's inefficient to operate
    - 85% efficiency at best

Decisions… Steam or Hot Water Boiler?

- Hot Water "Boiler"
  - It is less expensive to install
    - Boilers are smaller and less expensive
    - Piping is simpler and less expensive
  - It is more efficient to operate
    - 92% - 96%
  - It can be slower – depending on system design
  - Separate steam generator needed for air space heat if you have a batch pasteurizer

Decisions… New or Used Equipment?

- New
  - Some things you just can’t find used any more.
    - Cheese vats
    - Small batch pasteurizers
  - Some new items are much more efficient.
    - HTST systems
  - Some used equipment doesn’t pass current regulatory requirements
    - Ask before you buy

Decisions… New or Used Equipment?

- Used
  - Often is a great option.
    - Lowers up front costs
    - They just don’t build things like they used to
  - Make sure you know what you are getting
    - Demand has exploded and many buyers lack experience – some sellers don’t have the integrity that they should have.
  - Decide what level of involvement that you want to have in the process…
    - Of the hunt
    - Of the purchase
    - Of the rebuild

Decisions… New or Used Equipment?

- Used
  - Generally requires more effort
    - Research online or watching for ads
    - Traveling to see the equipment or poring over photos
    - Decisions on rebuilding
      - What needs rebuilt?
      - Who will do the rebuilding?