Chapter 1: Introduction

Opportunity Abounds

Are you interested in making your dairy business more profitable? Have you heard the term "value-added" but are unsure of what that means for your dairy or what your options are? Perhaps you have a concept for a dairy product but are unsure where to start. This publication will guide you through important issues—choosing a product, marketing, understanding the resources available for the new venture, and assessing profitability of your options—that you need to consider before starting a value-added dairy enterprise. Whether you are starting a new dairy business or exploring options for your existing dairy business, the world of value-added products provides numerous opportunities.

What is "Value-added"?

What does the term "value-added" mean to you? To the U.S. Department of Agriculture (USDA) Office of Rural Business Development, "value-added" is defined in the following manner:

The incremental value that is realized by the producer from an agricultural commodity or the product as the result of

1. a change in its physical state;
2. differentiated production or marketing, as demonstrated in a business plan;
3. product segregation;
4. the economic benefit realized from the production of farm- or ranch-based renewable energy.

Incremental value may be realized by the producer as a result of either an increase in value to buyers or expansion of the overall market for the product. In short, a value-added product is anything that you are able to differentiate from the competition so that consumers are willing to pay more for the product because of that difference.

Dairy Animals

When it comes to dairy and dairy products, cows typically come to mind. However, certain breeds of goats and sheep are also dairy animals. Each type of animal offers its own advantages and disadvantages to the production of value-added dairy products. Below is a short discussion of dairy animals.
Dairy Cattle

Dairy cattle are probably the most widely recognized animal when it comes to dairy production and dairy products. Five breeds of dairy cattle, Holstein, Jersey, Brown Swiss, Ayrshire, and Guernsey, are typically reared for milk production in the United States. If you currently have a dairy operation and are considering making the transition to producing value-added dairy products, you likely have dairy cows.

Dairy cattle produce a large quantity of milk compared to goats and sheep (discussed next), so you must be prepared to either produce a lot of your value-added item or find and secure a market for any milk you don't plan to use in your value-added enterprise.

Goats and Sheep

Goats or sheep can be a viable alternative dairy animal for someone wishing to enter into dairy production. Both of these animals produce a lot less fluid milk than dairy cows. The lower milk production can be both an advantage and a disadvantage. The percentage levels of fat and protein in goat and sheep milk are also higher than cows' milk, which offers advantages in certain types of dairy production, such as cheese and yogurt.

The equipment needed to milk goats and sheep is certainly different from that used to milk cows. This can be a drawback for someone wishing to transition from cows to goats or sheep.

Value-added Dairy Products

Several items typically come to mind when thinking about value-added dairy products. Some are relatively easy to produce, while others require greater investments in equipment, knowledge/training, and production time. Listed below are these common value-added dairy products along with a short discussion on each. You will find more information about various value-added products in Chapter 2.

- **Cheese** is probably the most popular and well-known value-added dairy product. Hundreds of cheese varieties are produced, ranging from soft cheeses (mozzarella, ricotta, etc.) to hard cheeses (cheddar, colby, swiss, etc.). Consider taking a cheese-making course before deciding on this type of enterprise.

- **Yogurt** is becoming more popular as people become aware of the health benefits of two probiotics in yogurt that aid digestion, *Lactobacillus bulgaricus* and *Streptococcus thermophilus*. Flavored and drinkable yogurts are among the leading yogurt products.

- **Butter** is a fairly traditional dairy product, with organic butter presenting a new twist on this product. The production of butter demands a large amount of milk fat, usually making dairy cows the choice animal. However, goat milk and sheep milk have greater percentages of fat, so these animals can be used if small quantities of butter are to be produced.

- **Ice cream** is a very popular value-added dairy product. Penn State offers a popular Ice Cream Short Course for those interested in learning about ice cream production.

- **Bottled milk** is regaining the popularity and appeal it once had. Some people like the feeling of knowing the farm and conditions under which the milk they are purchasing was produced. On-farm bottling requires only the equipment necessary for the bottling if selling raw milk. Glass or plastic containers can be used, with glass offering the appeal of environmental friendliness and nostalgia.

Meyer Dairy in State College, PA makes their own ice cream for sale in their store.
The following represent items that producers may not immediately consider as value-added dairy products because they often feel that the form of the milk must change (e.g., from fluid milk to cheese). However, if you consider that the milk or cow has a certain attribute or is being raised in a specified manner that people prefer or value, then these qualify as value-added.

- **Organic foods** are increasing in popularity among consumers primarily due to the perceived health benefits these foods offer as well as the perception that organic production methods are better for the environment. The term "organic" indicates that an item was produced without the use of synthetic pesticides or herbicides, genetic modification, added hormones, or antibiotics, and animals are fed only organic feed. For a product to be labeled organic, the farm must be certified organic by an approved certifier. With careful planning, the time required to fully transition livestock to organic production can be around two years. The potential payoff from organic production can be substantial. Some consumers are willing to pay considerably more (sometimes 100 percent or more) for an organic item over a conventionally produced item.

- **rBST-free milk production** is an emerging issue. rBST (recombinant bovine somatotropin) is a hormone naturally produced by cows. While there is no scientific evidence of differences between milk produced by cows given rBST and those not, consumers are beginning to voice a desire for milk and other dairy products from non-rBST-treated cows.

- **Products from grass-fed animals** are garnering interest among consumers. Grass-fed beef products are among the leaders. Some consumers' interest comes from a feeling of a healthier animal and product. For others, it comes from their preference for this type of management system. Grazing is another option to confinement housing and feeding. A grazing system of production requires the producer to have a specialized knowledge of grass management.

**Getting Started**

When evaluating the opportunity to start or transition into a value-added dairy business, consider the following questions:

- **Do I want to do this?** You should really want to do what you are proposing. If you don't fully believe in the product and its potential to generate a profit, reconsider your plans. Even if your plans for a value-added enterprise are fantastic, the success of the business could be sabotaged if you are not fully committed.

- **Are family members interested or in agreement?** The support of your family is essential and can be critical to the success of any small business. If your family members have serious reservations or are set against your idea to transition to or start a value-added dairy enterprise, you may need to consider putting off your plans until you can appease their concerns. Gaining family support may require providing the information they need to understand what you want to do, as well as integrating them into the planning and decision-making process.

- **Is this right for the farm?** Assuming that answers to the previous questions are positive and you currently have an operational dairy business, you will need to decide whether transitioning to or adding a value-added enterprise is a sound move for the business. Perhaps this is not the optimal time to make a change to the current business. It's possible that you cannot sustain profitability during the transition and you need to take some time to prepare the business for a change. Is producing value-added dairy products going to enhance the profitability of the business? If so, then you can continue your planning. If not, ask yourself why you are considering this option.

If you can answer "yes" to those three questions above, then you're ready to delve into the planning and decision-making process.

**Business Planning**

All well-managed businesses should have a business plan. A business plan is essential when starting a new enterprise or undertaking a major transition in an existing operation. Business plans provide a review of the history of the enterprise and goals for the future. The plan will serve as a road map for the management of the business, outlining goals and objectives. You should refer to your business plan on a regular basis to determine if you are accomplishing your stated goals and to make changes to the plan as needed. If you are unfamiliar with the business planning process, many programs and publications are available to assist you.

One of the first steps in the development of a business plan is to assess your current skills and those you'll need for the future. Here are just a few of the issues you will need to address.

- **Do you have, or have access to, the skills and knowledge necessary?** Starting or transitioning to the production of a value-added dairy item will likely require new and different knowledge and skill sets. These skills may encompass production techniques, equipment operation, marketing, and so forth. If your knowledge or skills are lacking, you can acquire the missing pieces through numerous and accessible resources such as fact sheets, publications, and short courses.

- **What resources (e.g., land, equipment, facilities, supplies, employees) will you need?** If you are starting your value-added dairy business from scratch, you need more resources than you would if you currently had an operating dairy business. Even with an operating business, you will probably have to invest in some new or additional resources. Producing many of the value-added items previously discussed will require specialized equipment. You may also need to invest in additional facilities to house this equipment and store your products.
Do you have access to the resources required and people with the skills or knowledge you need? Knowing what resources you will need is not enough. You also need to determine whether those resources are available to you. Are qualified individuals available, should you need to hire employees? Can you find and purchase the equipment required to produce your item? If your plans require land (e.g., for grazing), is quality land available within a reasonable distance?

Another major component of your business plan will be the financial plan and outlook. The financial potential of your value-added enterprise should be a determining factor in whether you proceed.

What is the profit potential? Can you provide estimates for your proposed business's profit potential? What are your estimates for cash flow in the first months to years of this business? You will need to formulate pro forma, or projected, financial documents for the value-added enterprise. If you are currently operating a dairy business, include financial information or documents to demonstrate your situation.

Are the financial resources available for start-up or transition? You will most likely need to tap into some sort of financial resource pool to start or transition to your value-added enterprise. If you need to apply for assistance from a lending institution, you will need the financial documents you developed to support your proposed enterprise's profit potential.

Your business plan will also need to contain a marketing plan. The marketing component is essential, particularly with value-added products. You will need to research the industry, competitors, and the market to prepare a comprehensive marketing plan. The information gleaned from your research will be useful in answering the following questions about marketing your product:

What customers would be interested? Knowing who will be interested in your product(s) requires an understanding of people's location, values, needs, and economic status. Academically, these are referred to as geography, demographics, psychographics, and behaviors.

How and where will the product be marketed? Part of your marketing plan will require you to decide on the channels through which you will market your product. Common marketing channels include the following: Direct marketing--on-farm markets, online stores, and home delivery, among others. Farmers' markets--found in most cities and towns, they provide an opportunity for agricultural producers to sell their products directly to the public. Community Supported Agriculture (CSA) programs--organizations where individuals (buyers) invest in the production of crops (fruits, vegetables, dairy, and/or meat) by a farmer. In exchange for this financial support, the farmer supplies the buyers with a share of the production. Wholesale marketing--if you are capable of producing large quantities of your value-added item, wholesale marketing to grocery stores, specialty shops, or restaurants is an option.

We will address these topics in more detail throughout this publication. You'll soon see that the most important aspects to evaluate when deciding whether to start a value-added dairy enterprise are marketing and financials. Without a market through which to sell your product and people to buy the product, your enterprise will not survive for very long. In addition to sales, many other areas impact enterprise profitability; therefore, properly analyzing a new enterprise's potential using appropriate financial tools is critical.

More information and many useful publications about the business planning process are available on the Penn State Extension website.

Chapter 2. Turning Your Milk into Value-added Dairy Products

It Begins on the Farm

Market demand, ease of extracting the milk, and the ability to obtain a worthwhile volume are the determining factors when selecting an animal species for milk production. This leads most farmers to dairy cows, dairy goats, buffalo, and sheep as their animal milk factory, with cows and goats being the most common.
During the 1950s and '60s, new processing regulations, increased competition from grocery stores, and changing consumer habits caused dairy farmers to abandon on-farm processing and focus on selling fresh, unprocessed milk to a dairy plant for processing and distribution. In the 1990s, an increasing number of dairy farmers reentered the milk processing business as a way to earn a greater return on their milk. By creating a specialty product or appealing to a growing consumer interest in locally grown food, some producers realized greater value by processing and selling milk and dairy products, allowing them to profitably continue as dairy producers without expanding their herd. With the success of some early adopters, more dairy producers are considering entering the processing and marketing side of the dairy industry. While the numbers seem attractive, with anecdotes such as, "I sell my cheese for $10 a pound, and 100 pounds of milk makes about 10 pounds of cheese, so I earn $100 per hundred pounds of milk," the wise dairy producer must examine the money, labor, and time needed to produce and, most important, sell the item. The impact on cash flow is another consideration. As a commodity fluid milk producer, you are paid next month by the processor for the milk produced today. With cheese production, for example, months of aging may be required to produce a saleable item. Diverting even 5 or 10 percent of milk to cheese production may cause severe cash flow problems before the cheese is ready to be sold.

Dairy producers may use various production practices, such as conventional, grass fed, certified organic, produced with organic methods, and produced with or without the use of rBST, to differentiate their milk items. While each of these methods' proponents often strongly support their process, there is little scientific evidence to substantiate one production method as better than another. Each producer must decide the method they wish to employ by thoroughly considering production costs and marketing advantages.

**Milk Production**

The quality of the dairy product will never be better than the quality of the milk. Bacteria counts and somatic cell counts must be managed for a quality value-added dairy product. High bacteria and somatic cell counts can create poor flavors in the milk, reduce its shelf life, and may adversely impact the processing of milk into other dairy products. This is why many milk processors and cooperatives offer quality premiums to their producers. Whether processing occurs on or off the farm, producing quality milk is important. For on-farm processing, producers should consistently be producing high-quality milk.

**Pasteurization**

The choice of whether to pasteurize your milk will be an important first question that you will need to answer as it will impact the types of products you can manufacture. Therefore, performing some amount of marketing research (discussed in the next chapter) prior to making this decision will be important.
Milk pasteurization is the process of heating every particle of milk or milk product to a high temperature for a minimum required time. There are two major methods of pasteurizing milk. Vat pasteurization requires heating a quantity of milk to a specific temperature (145°F) for a period of time (30 minutes) in a container. This method is typically used by smaller processors or to obtain specific flavors in milk. Producer-processors have invested up to $200,000 for used batch-processing and bottling equipment. High-temperature short-time pasteurization (HTST) is, as the name implies, the process of heating milk to a higher temperature (161°F) for a shorter time (15 seconds). It is also called continuous pasteurization since it occurs while the milk is traveling through a pipeline. HTST is used by larger processors and produces less of a "cooked" flavor to the milk. HTST systems typically begin at about $400,000. Some producers have reported little difference in cost between used and new systems since the used systems must be redesigned before being placed in a new location.

While pasteurization and the required equipment are often thought to be the main concerns, the process of pasteurization brings new questions to be answered. Homogenization, separation, and standardization are additional processes you will need to consider. Homogenization is the process of breaking the fat globules into smaller, more uniformly sized pieces whereby separation will not occur. Separation is the process of separating the fat from the milk. Standardization is remixing the cream and skim milk portions into a milk product with specific butterfat content. Depending on the types of products you plan to make, you may or may not need to invest in these steps. Products with a standardized fat content, such as 2 percent fat milk or ice cream, will require separation and standardization equipment.

Due to the multiple options available, dairy producers should contact their state's Department of Agriculture for specific requirements for an on-farm milk pasteurization facility before purchasing equipment and constructing buildings. An excellent way to learn about regulations and requirements is to visit other on-farm milk processing businesses and talk with equipment suppliers to understand the equipment needs and options that exist. A list of equipment resources is provided at the end of this publication.
Fluid Milk

Once you decide that processing your milk is something you want to do, you must then decide how much processing you will do. Direct sales of fluid milk offers you entry into the value-added marketplace with few or no additional processes. You can choose to market either raw or pasteurized milk.

If your choice is to pasteurize and bottle your milk, you will need storage facilities for unpasteurized and pasteurized milk, a pasteurizer, a separator and homogenizer (possibly), and a bottle filler and capper. Pasteurizing and bottling milk requires a significant capital investment. Producers have told of spending anywhere from $250,000 into the millions for the needed equipment. Some companies sell a complete system, while other companies sell new or used equipment and may offer engineering and design services.

In an effort to have a unique, differentiated product, some producers will make "cream-line" milk. This is pasteurized, unhomogenized, and sometimes unstandardized milk. The butterfat will separate and rise to the top of the container, so the consumer will need to shake the container to redistribute the cream before serving. In addition to being unique, the equipment needed to separate and standardize the milk is not required. While cream-line milk will be cheaper and easier to produce, some consumers may be seeking reduced-fat or skim milk products.

Today, a grocery store's dairy case reveals a magnitude of milk options: whole milk, 2 percent, 1 percent, skim, chocolate, low-fat chocolate, strawberry, organic, name brand, and store brand. Add to this different sizes and an on-farm plant's ability to produce homogenized or cream-line milk, a producer quickly has many product options. For example, a farm might start their value-added enterprise by producing whole cream-line milk in two sizes. Then after building a customer base and determining interest in other products, new flavors may be added. It is important to remember that milk does have a shelf life. After it has reached its sell-by date, it has no value and becomes a loss. Therefore, product mix and production levels are important business management decisions. This aspect is discussed further in the next chapter.
Raw (Unpasteurized) Milk

Fresh, unpasteurized (i.e., raw) milk and raw milk cheeses can be marketed with the proper license in certain states. Selling unpasteurized milk eliminates the need for dairy producers to purchase pasteurization equipment, lowering the capital investment required to start such an enterprise. However, you may be required to fulfill additional requirements. For example, in Pennsylvania, additional herd health, water, and milk tests are required for a raw milk license. You should check with your state's Department of Agriculture to learn the rules governing the sale of raw milk and products made from raw milk.

Currently, selling raw milk packaged for consumer use across state lines (interstate commerce) is unlawful. While this publication discusses the sale of raw milk, individual dairy producers are responsible for following the laws established for raw milk sales in their state of operation.

Risk management becomes an extremely important concern when marketing and selling raw milk, and raw milk products, as food safety is a critical concern. You must be willing to accept the risk of legal action if a foodborne illness outbreak occurs from any of your consumers ingesting raw milk. While the capital investment to produce a raw milk product is lower, a dairy farm is a valuable asset. Your farm, in the eyes of an attorney, is seen as a way to pay for damages and legal fees for a problem you created. Although it may be legal to market a raw milk product, you must consider the potential risks associated with the public consuming raw milk.

When selling raw fluid milk on the farm, the method of bottling is a question you must answer. There are two options. One option requires consumers to provide their own bottles or containers. Then, the only equipment required is a device that attaches to the
tank's outlet valve to make bottle filling easy. The second option applies if you wish to bottle your raw milk yourself. Additional equipment and facilities are required in that case. Milk containers must be mechanically capped, so you'll need to purchase a bottle-capping machine. Usually, a separate room must be constructed for bottle washing. You must also have refrigeration available to safely store the bottled product.

Distribution efforts and costs are minimal if you decide to allow your customers to self-bottle since they must come to the farm to get their milk. The only potential waste is milk lost during bottle filling. While some could decide to use a "self-service" strategy, you may find it beneficial to be present when filling to be sure the tank and equipment are properly cleaned and closed. Raw milk is marketed mostly by word of mouth from those desiring the product. Since the income generated from raw milk sales may be little more than "walking around" money, an expensive marketing effort is not often justifiable.

A bottle-washing machine used to clean returnable glass bottles.

Producers who wish to bottle their milk have the opportunity to create more markets. For instance, some health food stores may be interested in selling the milk. Since producers who bottle raw milk have made significant investments in additional equipment, you should develop a complete marketing plan before investing significant money.

Containers

If you intend to sell your milk off-farm, you will need to decide what size and type of container you will use. While choosing the container may not seem to be a major decision, successful marketers realize the value of the packaging when marketing their products. While your product inside the container may be what you are selling, the consumer will often make decisions based on the packaging and their perceptions of it. Therefore, the type of container is important to your marketing strategy and the image you are creating with your product.

With the shift to round, plastic bottles from square, paper cartons, convenience stores have seen an increase in single-serve milk sales. Realizing the need to be different and justify a higher price, many value-added dairy producers use glass bottles. Consumers like the nostalgia of the glass and often perceive a better taste in the product. These bottles are often sold with a deposit and consumers are asked to return clean bottles to recover the deposit. The deposit covers the cost of replacing bottles that are not returned. While manufacturers of milk bottles exist, the challenge is finding a working used bottle washer. Used bottle washers exist for quart and half-gallon sizes; they are very hard to find for pint-sized bottles.
Collecting a bottle deposit can be a challenge for some resellers of your milk. They may not have the facilities to hold returned bottles or the desire to handle them. Some producers who use glass bottles also purchase nonreturnable bottles for resellers who do not want returnable bottles. Plastic and paper cartons offer the convenience of a lightweight and ready-to-fill container.

**Marketing**

Since milk is a perishable product, marketing must be focused on reaching consumers and generating repeat sales. Some market outlets for producer-processors include on-farm markets, grocery stores and chains, schools, farmers' markets, specialty food stores, and home-delivery services.

Many successful on-farm processors have developed multiple marketing outlets to diversify and expand their customer base. Road traffic, population, family income, and distribution center location are some of the data farmers should evaluate when developing their marketing plans. Since most producer-processors sell their milk for a premium price, their success often depends on their ability to sell to less price-sensitive customers. As one direct-selling farmer said, "Eighty percent or more of the U.S. population says they want to support local farmers, but only 15 to 20 percent can afford to do so."
A Farmer's Perspective: Ojala Farm

David and Terry Rice of Williamsburg, Pennsylvania, own and operate Ojala Farm. In 1993, the Rices began to graze their herd and moved toward a seasonally calving herd. In 2002, they were provided an opportunity to sell their raw milk and so they followed the process for obtaining a license. Today, they have a base of customers who come to the farm to purchase their milk. New customers have come by marketing through word of mouth. David says, "The biggest challenge was finding the bottle-filling device to attach to the bulk tank. Another challenge is the milk truck. Sometimes people come for milk after the truck has picked up the milk. We try to educate our customers on its schedule." He continues, "Our raw milk sales are a few thousand dollars a year. It isn't a big income generator, but it has allowed us to generate a loyal customer base and expand into cheese production."

Cheese Production

History shows that cheese production is more than 4,000 years old. Cheese making was popular in the Roman Empire, which spread the technology through Europe to England. Cheese provides a way to concentrate the nutrients of milk, remove the fluid weight, and transform it into a form that is easier to store and transport. Due to the enormous variety of cheeses, this publication will only provide a general overview of cheese production. A list of cheese-making resources is provided at the end of this publication. The basic process of cheese production includes heating the milk and adding an acid or acid-producing bacteria, the enzyme (rennet), and salt to coagulate the milk and separate the solids (curds) from the remaining liquid (whey). The differences in cheese come from the milk's component levels, time, temperature, bacterial culture, and enzymes used during the process. By modifying these components, a producer can provide a truly unique product to its customers.

Producers may choose to make cheese using raw or pasteurized milk. In Pennsylvania, raw milk cheeses may be legally sold after a sixty-day aging process. Even though some states may forbid the sale of raw milk, they may allow raw milk cheeses to be produced and sold. Due to the aging requirement, raw milk cheeses are typically hard cheeses, such as cheddar, colby, gouda, and swiss. The aging requirement does eliminate soft cheeses from being made with raw milk since soft cheeses are quickly sold and consumed after manufacture.

By pasteurizing milk, producers have many cheese production options for both hard and soft cheeses. Soft cheeses have a higher moisture content than the aged cheeses do. Cream cheese, mozzarella, and ricotta are common soft cheeses. These cheeses have a limited shelf life and need to be consumed soon after being made. Herbs and spices can be added to the soft cheeses, especially cream and ricotta, to create new flavors.

Hard cheeses are pressed (to remove whey) and aged. The process of hard-cheese production is the same whether raw or pasteurized milk is used. The type of cheese you make is based on the ingredients used and the time and temperature variables. Some farmers purchase bacteria cultures, while others have developed proprietary cultures. As with many foods, consumers' preferences for cheese flavors differ greatly. Due to the potential variety, producers must keep detailed records about each batch of cheese. Following a consistent process will help ensure a consistent product. Due to flavor changes in milk, some cheese makers only produce certain cheeses at specific times of the year.

Many cheese producers purchase used equipment to enter into business. A "flat-bottomed" bulk tank may be used as the cheese vat. The tank can be reengineered to have hot water circulated through the refrigerant tubing to heat the milk for cheese making. In addition to a room for cheese production and a cheese vat, a refrigerated room for aging cheese is needed. These are typically the major investments for cheese making. Some producers have been able to enter the business for less than $100,000 of capital investment. Investing in specialized cheese vats, automated stirrs, and cheddaring equipment can easily double the investment. With persistence, the basic equipment can often be found in good used condition. Used refrigerated truck bodies and well-insulated rooms cooled with an air conditioner can be used for aging. Auctions of dairy farms, restaurants, and milk processing businesses are possible sources of used equipment. If your farm has a natural cave, you may want to find out if it can be approved for cheese aging. As with most milk processing operations, many states require a separate room for processing to take place. Since the milk often needs to be heated to begin the cheese-making process, most raw milk cheese makers divert milk from the bulk tank to the cheese vat to avoid the extra time and expense of reheating the milk.

For specific information on cheese making, interested farmers can obtain hands-on training from short courses and seminars conducted by universities, extension, agricultural organizations, and other cheese makers. A wide variety of books on cheese making exists, as well as resources from equipment manufacturers to assist in learning about the cheese-making process.

Today, a successful business is often determined by its marketing. Marketing is defined by the product, price, placement, and promotion, often referred to as the four Ps of marketing. An enterprise will not be profitable if you are unable to successfully market and sell your product no matter the quality. One cheese-making dairy farmer said he made thousands of phone calls over several months to market his cheese. Farmers have been successful in marketing their cheese through on-farm sales, farmers' markets, Internet websites, restaurants, and resellers (e.g., cheese shops, farm markets, and specialty food stores).

You have many opportunities to create new and different products unique to you and your farm with a cheese enterprise. Some cheese makers have developed cultures unique to their farm, which produces cheeses with unique flavors. Others have added spices
or experimented with different methods of aging, while still others discovered that the diet of their animals impacted the flavors of the cheese made. This is the art of cheese making.

Successful cheese marketers employ multiple marketing outlets to maximize their sales and minimize the risk of losing one large customer. Farmers should consider the ethnic makeup of their market. While you may like cheddar cheese, a Hispanic community may prefer queso fresco or an Italian community may prefer ricotta or mozzarella. Specialty food markets and restaurants are another market outlet that often exist in these communities.

Pricing is often a challenge for farmers. Some have adjusted their prices with the wholesale price of milk. Depending on your customers, changing price too frequently may create some confusion. Frequent communication with customers about why the price change is necessary can help. Since milk production and cheese production are two separate functions, producers should determine the value of their milk and have the cheese enterprise purchase it from the milk production enterprise. A reasonable and consistent price should be set. Some producers have found the final full price of a block of cheese to be more important than the price per pound to their buyers. One producer selling at farmers' markets learned that buyers there favored spending $5 per block. Therefore, they cut their cheese into retail sizes that valued $5. Another producer found that some customers, such as chefs, are more concerned with the volume, or quantity, of cheese they can purchase rather than price, so they prefer to purchase five-pound blocks.

A Farmer's Perspective: Clover Creek Cheese Cellar

David and Terry Rice, owners of Ojala Farm, make and market raw milk cheeses. Their entry into this market was a ten-year process. After converting their conventionally fed and housed herd to a seasonally bred grazing herd, they began exploring ways to earn more money from their milk. They visited other dairy producers who made and marketed cheese and attended cheese-making classes conducted by extension and others. David said, "Our first interest was making and selling yogurt. We did some market surveys and determined low local interest in it. In addition, we learned that cheese with a longer shelf life provided less risk of loss if we didn't sell in it time."

In the summer of 2005, they worked with another cheese-making dairy producer to custom make raw milk cheese using their milk. They contacted their Pennsylvania Department of Agriculture representative to obtain the proper permits for this venture. Their only costs were for milk production and the investment in a used refrigerated walk-in cooler to store and age the cheese. This strategy allowed the Rices to develop a market for their cheese and determine if they had the demand and personal desire to justify investing in their own facility.

In October 2005, they began marketing their cheese under the name Clover Creek Cheese Cellar. Their marketing methods included on-farm sales to their raw milk customers, farmers' markets, other farm markets, specialty/health food stores, and restaurants/resorts. An additional investment was an employee who helped market the cheese and assist with general dairy farm work. A person skilled in marketing at farmers' markets and direct selling to consumers was necessary since the Rices had little experience with this. They continued to have cheese custom made for them through 2006.

During 2006, they learned that not all farmers' markets were good markets for them, and some resellers (the other farm markets, food stores, etc.) were more successful selling their cheeses than others. While farmers' markets offer the opportunity to meet and build a customer base and provide the greatest gross income from the cheese, they are time consuming and, after considering the time invested in traveling to and from the markets and staffing the booth, may not be as profitable as initially believed.

Then another opportunity arose in 2006. The Rices were part of a group of cheese-making dairy farmers to meet the chefs at Nemacolin Woodlands Resort in Farmington, Pennsylvania. Their extension educator organized the gathering after meeting with the executive chef, Jeremy Critchfield, and learning of his interest in local food. This meeting resulted in the Rices obtaining the resort as a significant customer.

After reviewing their 2006 sales and meeting with their accountant, David and Terry made the decision to build an on-farm cheese plant. By using family labor and buying used equipment, David estimates that construction expenses ran about $60,000. When asked what he has learned and what advice he would pass along to others, David states:

If you want to get into the business, you have to go little by little, unless you have someone bank rolling you. It's too bad you can't work with your design and equipment for two years before you have to build it. You almost can't farm and do cheese at the same time. I could spend twelve to sixteen hours a day making and taking care of the cheese and more than six hours a day selling it. Sometimes I wonder if we should just buy our milk and spend our time making and selling cheese. It is worth the money to hire a consultant or experienced cheese maker to assist you as you begin making cheese. We dairy farmers can't compete with Kraft and the other national brands, so we have to figure out what makes us different and market it.

To get an idea of the time required to make cheese, David was asked to give some time estimates. These numbers represent a "batch" of cheese, which for him is about 100 to 150 pounds of product. The first day consists of two people making the cheese and pressing it. One person spends five hours and the second person provides two or three hours. On the second day, the cheese is removed from the press, weighed, and moved to the drying room. One person does this process in two hours. On the third day, one person spends about two hours applying a cream wax and moving the cheese to the cooler for aging. During the aging process (the
next sixty days), the cheese is turned and other maintenance is performed, which will take one person about fifteen hours. While
the aging process may not be time demanding for one batch, if you make just two batches a week, you will be simultaneously
managing twenty-two batches. After aging is completed, the cheese must be prepared for sale. This will take one person about two
hours. By doing the math, you realize David's earlier comment, "spending twelve to sixteen hours a day making and taking care of
the cheese," is correct. He admits the physical labor required in his plant could be reduced with specialized equipment, but that
would double or triple his investment and not save much time.

Dave Rice prepares wheels of cheese for aging.

Ice Cream Production

As with cheese, ice cream production offers you many options to create unique and specialized products. The ingredients and
processing method you use will impact the final result. Ice cream can be sold by the dish or cone, in pints, quarts, half gallons, or
three gallons, and as an unfrozen mix. It also requires an effective marketing program to differentiate your product from currently
available products. As with milk, ice cream varieties must meet certain standards to be marketed as such.

Without going into much detail, ice cream can be produced by two methods. With the first method, dairy producers can custom
make an ice cream mix for sale to retailers. The retailers will then produce and sell the final frozen ice cream product as their own.
This method requires less production effort and equipment. In the second method, the dairy can produce and sell its own ice cream
mix, which ensures a unique product to the dairy business. Separating, standardizing, mixing equipment, and frozen storage
facilities will be needed and transportation equipment may be required.

Due to the significant science required to produce a consistent ice cream product and the standards that ice cream varieties must
meet, classroom and hands-on training is recommended for people interested in making ice cream. A number of universities offer
ice cream short courses. These intensive training programs provide the participants with the science and experience necessary to
succeed. Additional information is listed in the resources section.

Ice cream offers many marketing options depending on the product and the desired market. Many options exist, from a
free-standing shop to the grocery store frozen foods section. A popular way to enter the ice cream market is by selling cones. This
offers many advantages. Consumers can try the product in a small quantity. At the same time, the manufacturer can quickly test
new flavors. Selling cones also offers the opportunity to sell other ice cream products, such as sundaes and shakes, as well as to sell
flavors in pints, quarts, and half-gallon sizes. By creating a strong brand name and quality product, the maker can explore
marketing options through resellers.

While ice cream has a longer shelf life than milk does, it still requires the capital investment in frozen storage and transportation.
Additionally, the daily maintenance costs to keep the freezers operating add to the storage costs. You need to consider these
investments and operational costs when entering this market and pricing your product.

At Homestead Creamery, they took the approach of starting small with their ice cream business and growing it over time. An ice
cream trailer allowed them to effectively go to the customer. The ice cream was sold as dipped cones at fairs and festivals. It was
an effective way to get consumers to try the product and create name recognition, which translated into increased sales from
grocery stores and home delivery. Today, twelve standard flavors are produced in addition to a "flavor of the month." Since their
business has grown, the owners decided to get flavor-specific containers printed. While this seems like a simple decision, it was a
significant investment. Donny said, "We decided to print four flavor-specific containers. Obviously, they are our top sellers. This was a $30,000 expense. Much of the cost was due to the design work and producing the 'plates' from which the container design was printed. The other challenge is finding storage space for these containers since we needed to order a large quantity to justify the purchase. We'll keep using our standard container with a flavor-specific label applied for the other flavors. It's not as pretty, but it's much less expensive."

**A Farmer's Perspective: Homestead Creamery**

Donny Montgomery is a partner and president of Homestead Creamery in Wirtz, Virginia. The business began in 2001 with two dairy farmers and an owner of a butcher shop when Donny's son returned to the family farm. The partners bought a Pladot® milk processing system to make milk, yogurt, butter, and ice cream.

The creamery offers a full line of milk and flavored milk in returnable glass quart and half-gallon bottles, butter, and ice cream. They market through a retail store at the plant, two grocery store chains, convenience stores, and four home-delivery trucks. Donny says:

> This is a challenging business. Before we got started we talked with people at Kroger®, a local grocery store, about selling our milk. They said, "Bring us some samples and we'll talk about it." Well, how do you bring them samples when you haven't started because you don't know if you can sell enough to justify the investment? There is a reason why they say, "Most start-up business fail in five years." After four years, we began to see some success, but by then we wondered if we should invest any more money into the business. We were fortunate. We got started before the local food movement began, so we could take advantage of it. We were selling into some Kroger stores, but we had to deliver to them, merchandise them (rotate and stock the shelves), and return bottles and out-of-date product. Then Kroger decided to build a regional distribution center near Roanoke and a store in Smith Mountain Lake, just south of us. Now we are in more stores through their distribution center and their truck stops at the plant to pick-up product and return bottles.

As part of their marketing strategy, the business invested in an enclosed "ice cream trailer" that is taken to fairs and festivals where hand-dipped ice cream cones are sold. They found the ice cream trailer to be a good way to introduce their product to potential customers and create brand name recognition—not to mention a very profitable way to sell ice cream. To grow their business, the partners decided to go to their customers. They began a home-delivery service. This business segment has grown into four home-delivery trucks selling their dairy products and a variety of grocery items such as eggs, bread, cheese, orange juice, and frozen food items.

As with any new business, they have had challenges to overcome. An accident meant they needed to purchase a new milk truck to get the milk from the farms to the plant. They produced a variety of items to offer more sales opportunities. An analysis of product line profitability revealed that while yogurt offered the opportunity for profit, the amount sold did not generate a profit, so they stopped producing it. Varieties and sizes of milk were evaluated, which resulted in some products being eliminated or sold in only one size.
Pennsylvania Inspection Requirements

Dairy farms and milk processing plants that want to sell milk products across state lines (interstate commerce) must be federally inspected. Here is a list of products and inspection requirements for producers in Pennsylvania:

1. State-inspected raw fluid milk is not allowed across state lines under any circumstances.
2. State-inspected raw sixty-day aged cheese is allowed across state lines. USDA may perform spot check inspections from time to time.
3. State-inspected cheeses, butter, whey, milk powders, condensed milk, and ice creams are allowed across state lines. Some production facilities may need to be USDA inspected.
4. Fluid milks, yogurt, buttermilk, flavored milks, cottage cheese, sour cream, goat milks, eggnog, potato chip dips, half and half, heavy whipping cream, and light creams that are going to be sold only in Pennsylvania need to be inspected by the Pennsylvania Department of Agriculture (PDA). If these products are going to be sold outside Pennsylvania, they need to be inspected by both PDA and the Federal Food and Drug Administration.

Other Value-added Opportunities

Depending on your potential and that of the market, yogurt, butter, and pudding are other value-added dairy products that can be made and marketed. Creating a market and selling enough of these products may be a bigger challenge than making the product. While some farmers have had success with yogurt, butter, and pudding, others have found it difficult to generate demand and create a product worthy of a premium price. The following is a brief look at these products.

Butter

Butter is the concentration of milk fat into a solid form by physically stirring the cream. For processors who separate the cream from milk, butter can be produced to use this extra cream. Butter production requires pasteurized milk (cream), a cream separator, a butter-churning device, and some method to package the butter. In some ways, butter is a commodity product. However, you may find some ways to differentiate butter products, such as producing flavored butters or salt-free butter.

Yogurt

Yogurt is a fermented milk product that can be made with cream, milk, or skim milk and the bacteria *Lactobacillus bulgaricus* and *Streptococcus thermophilus*. After the milk is heated, it is cooled and inoculated with the bacteria, which produce lactic acid. Fruit or other flavorings may be added. Specialized equipment is required to make yogurt; a fermentation vat will be needed in addition to a filling and capping machine to package the product.

Yogurt is growing in popularity in the United States, though it still enjoys more popularity in Europe and Mexico. There are different types of yogurt, and American consumers tend to prefer sweeter yogurts produced from low-fat or skim milk, while other cultures prefer thicker, less-sweet yogurt. You'll want to research your potential market before deciding what type of yogurt to produce.

Yogurt also has a limited shelf life. Some producers have experienced significant losses from out-of-date products, while others have been quite successful with yogurt. Therefore, your pricing strategy should account for these potential losses. Again, it's important to research and understand your target market to accurately estimate product demand. Market research is discussed further in the next chapter.

Pudding

Pudding is a thickened, sweetened, and flavored product made from cream or milk. Though limited, a few dairies have been successful in making, marketing, and selling pudding. As with yogurt, pudding will require specialized heating, mixing, filling, and capping equipment.

Organic Milk

Certified organic milk is a value-added product since a specialized production process is used. Selling organic milk requires the farm to be certified organic. In areas with a strong demand for organic dairy products, certified organic dairies may want to pursue processing their milk.
Summary
Dairy producers who want to make a value-added item have many options. The choice of what product to make should be
determined by the producer's interest, consumer interest, required equipment, and marketing and sales methods. Where legal,
selling raw milk or raw milk cheese provides the farmer with the least required investment. By investing in pasteurization
equipment, the producer can diversify into reduced fat milk, flavored milk, soft cheese, ice cream, butter, yogurt, and pudding.
While choosing the best product to make may seem to be your most important decision, marketing your product (discussed in the
next section) is often the most important process since the added value you're after is only earned by selling the product.

Chapter 3. It's All About Marketing

Marketing
Beginning a new farm business can be both exciting and challenging. With well-conceived planning efforts, you can minimize the
challenges you'll face. The planning process affords you an opportunity to identify the product and coordinate marketing and
production efforts to create a consumer-producer win-win situation. Along the way, it's critical to pay close attention to all costs
involved so that you can accurately evaluate potential profitability (discussed in Chapter 5). Business and marketing planning is
undoubtedly time consuming in the short run, but if you make the time and dollar investment, your new venture will have a better
chance of success.

Despite a decrease in purchases of traditional dairy products (for example, fluid milk, butter, and ice cream), specialty dairy
products are showing growth and consumer interest. So, consumers are not completely abandoning dairy products; they are simply
turning to different ones. Products with certain characteristics (e.g., milk type, production practices, quality perception) are
increasingly valued by consumers, as reflected in cash register sales.

Market Drivers
Consumer demand may be the most significant signal for exploring the development of a new dairy product. Value-added dairy
product growth is a subset of the larger specialty foods market. Specialty or niche products typically sell at a higher retail price
because they are perceived to be of higher quality or are processed using select production practices. General growth in the
specialty foods market can be attributed to a handful of factors, including consumers' preference for higher-quality food products,
increased familiarity with new products through travel and/or media exposure, and heightened interest in food production practices
such as local or organic.

Current estimates put a $38.5 billion price tag on the specialty food market each year. In addition, consumers are buying more
specialty products, relative to mainstream food products, in almost every product category. The downside is that these numbers are
enticing new value-added dairy producer-processors into the market all the time. This is why even though strong market potential
exists, you'll want to plan on having lots of competition.

Key factors believed to influence consumer interest in different dairy product markets are described below. Referred to as "market
drivers," these factors differ somewhat, depending on the nature of the product.

Key market drivers behind the U.S. fluid milk market: 1

• Organic
• Despite showing an annual growth rate of 23 percent over the 2001-2006 period, organic milk sales are still
  small—approximately 3 percent of total milk sales.
• The higher-priced organic milk, which may be as much as twice that of commodity milk, may discourage new consumers who
  are more price sensitive. Many consumers have indicated a preference for an in-between product, such as nonorganic milk with
  specific characteristics (e.g., produced without hormones, including rBST) to avoid organic milk's high price.
Key market drivers behind the U.S. specialty cheese market: 2

- Specialty cheese sales grew 28 percent over the 2003-2005 period from $907 million to $1.16 billion.
- Specialty cheese market growth is attributed largely to the same factors influencing specialty products in general: increased visibility through media outlets such as the Food Network, increased international travel, and positive consumer response to cheese plate offerings/desserts at U.S. restaurants.
- An especially attractive specialty cheese consumer segment are the Baby Boomers, those born between 1946 and 1964, who display a willingness--and have the ability--to pay higher-than-average prices.

Key market drivers behind the U.S. ice cream market: 3

- The challenge in the ice cream industry has been to meet two seemingly different consumer preferences, health and indulgence, both of which have spurred new product development.
- Among new product trends are products claiming to be natural, organic, fair trade, kosher, and allergen free.
- Growth in organic ice creams is small but promising despite the higher costs of products in this category.
- Consumers appear to be shifting their ice cream purchases from grocery to convenience stores, driven in part by younger consumers that are more convenience oriented.

Key market drivers behind the U.S. yogurt market: 4

- Market reports indicate that the three consumer groups most likely to purchase yogurt products include women, children, and ethnic (including Hispanic and Asian) consumers. Purchasing patterns of these consumer groups are watched especially closely in this market.
- Consumer interest in all-natural and organic product markets has also contributed to yogurt sales growth enough that companies like Dannon now have their own line of organic yogurts.
- Scientific research suggesting that dairy products aid in dieting efforts has also contributed to strong sales, as have industry promotional efforts to convey a sense of indulgence to consumers.
- Because yogurt is a healthy snack, it’s competing with other healthy snack choices and beverages, such as drinkable yogurts, that offer health as well as convenience.
Key Findings from a Specialty Cheese Study

The market data presented above suggests that specialty, or value-added, dairy products, as a whole, are enjoying strong growth nationally. In a study to examine the market potential for value-added cheese, a number of important findings emerged that seem applicable across the different types of value-added dairy products. In general, the study finds that marketing efforts are facilitated by unusually high levels of consumer interest, which works to the producer's benefit. Essentially, consumers are hungry for these types of products and actively seek them out. Even so, attention to marketing fundamentals remains a necessity. Described below are six key points identified from the specialty cheese report. They are interpreted here in a broader context of value-added dairy products to help you think about how you plan to market your product.

1. Survey respondents included three groups: New York state winery retailers and New York City restaurant chefs and cheese buyers at specialty/gourmet shops. Collectively, these groups noted that the consumer interest they are seeing in specialty cheeses is a reflection of consumer interest in the broader category of specialty foods.

2. Respondent groups indicated that they continually seek out new specialty value-added products and would welcome additional locally produced offerings. In general, specific interest in locally produced products is a tremendous opportunity for producer-processors in the Mid-Atlantic and Northeast markets because of product flow across state boundaries. In other words, these two regions are small enough that the term "local" may not be limited to state boundaries but may encompass a bigger, mass metropolitan market. For example, products from southeastern Pennsylvania may still be considered local even when marketed and sold in Washington, D.C.

3. Product price points vary by market and market outlet. Your pricing strategy should take into account all production, distribution, and marketing expenses incurred to deliver a product to market.

4. You'll want to consider the challenges associated with seasonality of both production and consumption patterns. For instance, in the value-added cheese market, there is a distinct peak in consumer sales late in the year at holiday time. This is in direct contrast to the peak milk production in spring months. If you are not planning on dedicating all your milk to value-added production, you will need to determine what to do with the unprocessed milk. Ultimately, your ability to coordinate milk supplies with processed product supplies is the first step toward later coordinating the quantity you can supply to each market outlet.

5. Adequately compensating for poor product quality with other production and marketing efforts is difficult. A high-quality product is its own best asset and, where priced and promoted appropriately, can offset other marketing challenges.

6. Value-added products are generally being well received by consumers. But this is not to say that all consumers are well educated about these products. Every effort to help share information about your production process and prominent product characteristics with customers is welcome. In the case of value-added cheeses, tell the "cheese story." This same story concept applies to all other value-added dairy products as well. These stories, or background information, help the customer feel more connected to you, the processor, and your production process.

All told, the specialty cheese study points to several factors that make marketing a bit easier. These same factors are applicable to marketing of specialty dairy products in general. Factors that make value-added dairy product development an attractive opportunity include proximity to large metropolitan markets, customer excitement about new product categories, and the depth of dairy industry resources in the Mid-Atlantic and Northeast regions.

The primary downside is that while you may consider value-added dairy processing to be an attractive new venture, so too might other dairy producers in your area. The real key to confronting new competition in the market will be to develop a high-quality product at the lowest possible cost and effectively market it to your target audience. The more marketing savvy you are, the greater your chances for new venture success and the harder it will be for your competitors to keep pace.

Market Potential, If You Do It Right...

Of course, not all new product stories are successful. This publication is an effort to help you increase your chances of success through a thoughtful planning process. Marketing a new value-added product introduces its own challenges, but if you start with a high-quality product and pay close attention to marketing fundamentals, you'll be starting the process with better odds. Keep two important marketing concerns in mind as you move forward. First, many producers-turned-processors have struggled with switching gears from a production mindset to a marketing one. Milking cows is a full-time job by itself, and the processing and marketing efforts required in getting a value-added product to market should not be underestimated. Second, be strategic in the additional responsibilities you undertake. Ensure that issues associated with distribution, packaging and labeling, and promotional efforts are adequately addressed early since they are the foundation of your marketing effort. For instance, you could plan in advance for family members or employees to help with these responsibilities.
Market Outlets and Associated Marketing Channels

A plethora of marketing channels and associated outlets exist for you to consider. A marketing channel is the general pathway used to deliver a product to a particular market. Depending on your buyer, you may sell to an intermediate buyer versus an end user and then use a distributor or wholesaler to move your product from the farm gate to the buyer. The market channel is defined by the different agents that help you move and sell your product.

For example, if you choose to sell to a local restaurant, you are selling to the chef, who in turn sells to the individual customer. Whether or not you self-distribute to the restaurant will also help define which marketing channel you're using. In this case, you are selling to an intermediate buyer because he/she will in turn pass it along to the end user. This is an example of wholesale selling, which is much different from selling directly to the consumer at a farm stand or farmers' market and different yet again from selling to a cooperative that will market your product.

Table 1 and Figure 1 were developed as part of a perishable product distribution study to help producers think through the different distribution choices they confront. Table 1 presents individual producers' choices regarding distribution, what market pathways their products may take as a result of their distribution options, and the associated pros and cons. For example, Producer C may choose to supply a finished product, such as homemade premium ice cream, to a cooperative. In turn, the cooperative may try to sell the product, using its established marketing infrastructure, to as many different types of buyers as possible. The upside to this option is that the producer-processor does not have to assume as much of the marketing responsibility and can leverage the cooperative's marketing strengths. On the other hand, the producer-processor likely concedes some control in how the product is marketed.

Figure 1 is the graphical illustration of Table 1. Again, Producers A to G confront decisions at different marketing stages. In other words, Producers A to G have several choices over how and in which markets their products are sold. The first question for dairy producers is whether they want to supply a processor with milk or process the value-added item themselves. In Figure 2, this is the equivalent of assembling or processing the finished product. Column 3 forces producers to ask whether or not they seek wholesale sales. If so, producers may handle both physical product movement and the sale transaction themselves or work through a second party, such as a distributor or nonprofit organization, that will assume one or both tasks. Fourth, producers must decide in which markets to sell their products. Choices may include food service, retail stores, specialty food stores, or nonprofit outlets such as food banks. Finally, consumers are defined by where and how they purchase the finished product. Consumers may purchase a specialty cheese product from a gourmet grocery store but buy a frozen yogurt dessert from a local vendor. Note that neither Table 1 nor Figure 1 is a complete itemization of each channel's strengths and weaknesses. Instead, it offers the most prominent pros and cons associated with each option.

<table>
<thead>
<tr>
<th>Producers</th>
<th>Distribution Options</th>
<th>Market Channels</th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Producer A</td>
<td>A producer-shipper who does his own packing and shipping (may also handle other producers' products)</td>
<td>Any or all channels to consumers</td>
<td>Offers producer more autonomy over packaging and labeling processes Can offer same service to other producer-processors to off-set investment costs</td>
<td>Capital intensive Once purchased, producer is committed to using equipment</td>
</tr>
<tr>
<td>Producer B</td>
<td>Packers, brokers, or producer-shippers</td>
<td>Any or all channels to consumers</td>
<td>Costly in time and money to continually update market data</td>
<td>Has all options available</td>
</tr>
<tr>
<td>Producer C</td>
<td>Some type of group (e.g., co-op that negotiates prices or terms of trade with other firms that distribute)</td>
<td>Any or all channels to consumers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>-------------------------------------------------------------------------------</td>
<td>--------------------------------</td>
<td>-----------------</td>
<td></td>
</tr>
<tr>
<td>Producer D</td>
<td>Some type of group (e.g., a limited-liability corp. that packs and ships products for members)</td>
<td>Any or all channels to consumers</td>
<td>Some marketing responsibilities shared by the group. More producers suggests larger volumes that would open up marketing opportunities. May have less control over some marketing decisions. May have to go with group consensus.</td>
<td></td>
</tr>
<tr>
<td>Producer E</td>
<td>Some type of group (e.g., a co-op that operates its own distribution system and may market branded products)</td>
<td>Any or all channels to consumers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Producer F</td>
<td>Nonprofit organization that buys and distributes farm products</td>
<td>Distributes products to program participants or uses other market channels to consumers</td>
<td>Offers high degree of community involvement. Possibly offers discounted distribution costs. Buyer may be fairly price sensitive.</td>
<td></td>
</tr>
<tr>
<td>Producer G</td>
<td>Sells direct to consumers through roadside stands, farmers markets, online, and/or community supported agriculture groups</td>
<td>Consumers or program participants purchase direct from farmers</td>
<td>Low cost in terms of capital overhead. May afford some level of convenience (e.g., proximity to farm or market). Can be time costly since most of marketing efforts assumed by the producer-processor. May not offer as much customer visibility as other marketing channels.</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1. Perishable agricultural product assembly and distribution.
Coordinating Supply and Demand

The time taken to research and determine the amount of product you will provide to each of your chosen market outlets will be time well spent. Thus, you need to first identify your short- and long-term goals for the enterprise. What you would like the enterprise to become will help you think about what volumes you'll want to produce and where you might sell the product(s). For example, are you primarily looking to participate in a local farmers' market where you move smaller amounts of product but can interact with customers? Or are you more interested in having the local restaurant buy your product(s) and minimize the customer face time? These are just examples of the types of questions you'll want to consider as you work through business and marketing plans.

Smaller markets are often an attractive first option while you refine production processes and work up to full capacity. You will likely find it easier to scale up production than to have to quickly identify new buyers for finished product (with limited shelf life). Starting in smaller, less formal markets may also offer producers the advantage of being able to gather customer feedback on products before entering larger, more costly markets.

Many producer-processors find they can quickly produce more than they have demand for. Even those looking to sell their products at the local farmers' market often find they have an ability to produce more than they might sell in a given week. Table 2 helps illustrate how milk from even a small number of animals can result in relatively large product volumes. Keep in mind that Table 2 uses average estimates on milk yield and conversion rates for different animal and product types. The key idea is to point out how easily you might exceed your expected sales volume at a particular market outlet.

Let's look at two examples using information from the table.

**Example 1**

You are a dairy producer with a herd of approximately fifty dairy cows looking to sell a specialty yogurt at local grocery stores and farmers' markets. If you use all the milk produced by your herd each week, you could conceptually produce more than 17,000 gallons of yogurt (assuming a conversion rate of one pound of raw milk for every one pound of yogurt). In terms of finished product, this is the equivalent of 272,000 eight-ounce containers of yogurt that would require a market outlet. Even if you had several interested dairy case buyers and good attendance at farmers' markets, this is a lot of yogurt. In this case, you might consider allocating only a percentage of your weekly milk production, say 10 percent, which will still allow you to produce approximately 1,500 gallons of yogurt (24,000 eight-ounce containers) each week for all your customers. You could then market the remaining 90 percent of weekly milk production as you did previously--likely through a milk marketing cooperative. Note that you will want to discuss your processing interests with a co-op representative as the volume you supply to the co-op will be smaller.

**Example 4**

Your family has ten dairy sheep and you are thinking about processing specialty cheese. Because you work off the farm, you're not looking for large-scale production capabilities due to the time commitment associated with a new venture. Rather, you prefer the idea of staying in local markets--the farmers' market is especially appealing--and keeping production volumes fairly small. Table 2 suggests that as a guide, you could potentially produce 30 pounds of cheese each week. If this is more cheese than you expect to sell each week, you might consider making cheese every other week or finding a larger local outlet, such as a nearby restaurant that might be interested in using the cheese as a dessert item, on salads, or in an entreé.
Table 2. Weekly product yield estimates by milk type.

<table>
<thead>
<tr>
<th>Herd size</th>
<th>Cow</th>
<th>Sheep</th>
<th>Goat</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>50</td>
<td>100</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>894</td>
<td>1,788</td>
<td>3,577</td>
</tr>
<tr>
<td>15</td>
<td>537</td>
<td>1,341</td>
<td>2,683</td>
</tr>
<tr>
<td>25</td>
<td>894</td>
<td>2,236</td>
<td>4,471</td>
</tr>
<tr>
<td>50</td>
<td>1,788</td>
<td>4,471</td>
<td>8,942</td>
</tr>
<tr>
<td>100</td>
<td>3,577</td>
<td>8,942</td>
<td>17,885</td>
</tr>
</tbody>
</table>

Milk production estimates are average approximations of weekly cow, goat, and sheep production volumes and are not associated with any particular breed. Recognizing that milk production is a function of several factors, these estimates are used only to illustrate how quickly supplies can accumulate. Note also that milk-cheese conversion rates are highly variable depending on the type of cheese produced. Those used here are representative of hard cheese (e.g., cheddar) production.

Sources: American Dairy Goat Association; Mark Stephenson, Cornell University; Tatiana Stanton, Cornell University; Carol Delaney, University of Vermont; Stephanie Clark, Washington State University

Though difficult, it is recommended that producer-processors think backward when they work through their marketing plans. In other words, you'll want to first identify market outlets where you'll sell product, estimate demand volume, and then define production schedules accordingly.

Moving Product to Market Fast

Regardless of which value-added dairy item you decide to produce, the highly perishable nature of dairy means you'll have to be as efficient as possible in delivering it to market (the only exception being hard cheeses that call for an aging process). In general, perishable products operate under an already narrow marketing window, so you must identify cost-effective and timely distribution strategies. In addition, value-added dairy products are typically low-volume, high-value products, making them "high-maintenance" goods for retailers.
There are two distribution options: self-distribution and outsourced distribution. You may initially feel that outsourcing distribution costs is more expensive than you would like. In this case, you'll need to carefully identify your self-distribution cost options and compare expenses. The tight timeframe for marketing dairy products tends to increase marketing costs. By comparison, more shelf-stable products may have lower marketing costs simply because they do not necessitate such strict climate-controlled storage and transportation features. Keep in mind that the risk of not getting the product to market in a timely fashion may be costly. That is, you may encounter an additional cost to dispose of a spoiled specialty dairy product if it is not delivered to market in time.

**Calculating Market Demand**

Estimating market demand can be quite difficult. Rarely does any producer or processor know how many consumers will buy a new product. What is possible, though, is to use publicly available data sources, such as state and local population estimates, to determine a good reference point. Knowing something about possible market size, and therefore demand, will help you adjust production schedules accordingly.

Numerical information is valuable in guiding you through your marketing planning. For starters, it helps you take an idea and evaluate whether or not this could become financially feasible. Whether your goal is to provide a specialty dairy product to the local farmers' market or compete in New York City gourmet grocery stores, you'll need to find an economically viable production and marketing strategy that allows you to stay in your market of choice.

The process of calculating market demand is manageable. We suggest a six-step approach to help you identify possible resources for finding numeric data and ways to use that data effectively.

1. Identify which markets interest you. These may be formal retail outlets, such as grocery stores, restaurants, and specialty shops, or they may be your own farm stand.
2. Start with a "big-picture" number of total population to use as a starting point. U.S. Census data is a reasonable starting point for many of the mid-sized to large markets that may be of interest to you. For smaller, local markets, check with the chamber of commerce or local government offices for market data.
3. Begin to narrow the population number since only a portion will purchase your product. Consider narrowing by geographic boundaries (for example, county or zip code), personal demographics (for example, persons in select age or ethnic groups in your market of interest), price sensitivity (consider income data as a benchmark).
4. geographic boundaries (for example, county or zip code),
5. personal demographics (for example, persons in select age or ethnic groups in your market of interest),
6. price sensitivity (consider income data as a benchmark).
7. Consult with individuals in each of the outlets where you would like to market your product (for example, managers at the grocery store, restaurant, or farmers' market) regarding their customer numbers, frequency of visits, and so forth.
8. Profile your market outlets individually by calculating different sales scenarios. With relative ease, you can create a spreadsheet using your target audience estimate and different estimated sales volumes per evaluation period (say, weekly).
9. Aggregate sales estimates from the different markets in which you're interested and remember to make updates as your participation in the markets evolve.

Any effort to quantify your target market is helpful. The best case scenario is that market demand estimates closely match how much you supply to the market. Even where estimates are conservative, adjusting production volumes upward will most likely be easier than generating new consumer demand quickly while you're working against the perishability factor.

**Defining Customers and Determining Their Needs and Wants**

Defining your customers and determining their needs and wants are central to nearly every marketing effort you'll undertake. Without customers, there are no product sales. Subsequently, marketing efforts are an exercise in meeting customer likes and desires and avoiding their dislikes. For many small-scale processors, a single retail customer type may be frequenting the handful of outlets where you sell your specialty dairy product, or there may be several different customer types depending on the average number of customers, their past purchasing patterns, and how much they are willing to spend.

The trick to successful marketing is in knowing your customer prior to putting a product on the market so you can tailor marketing efforts proactively. That is, you do not want to be learning how to market your product in hindsight. Doing so will likely result in lost income as the product sits on the shelf while you learn how to more effectively target your audience.

Regardless of how many customer types you typically encounter, you need to consider the buyer's perspective and work to make the interaction as positive, yet economically rewarding, as possible. In other words, you're looking for the right "value proposition" for both of you. Here are some things to keep in mind as you approach customer-oriented marketing efforts:
• Are these customers end users or intermediate buyers, such as a distributor or chef/restaurant, and how does their position in the supply chain affect their use of the product and price point? For example, a distributor may be more concerned with volume supplied than creative packaging.

• Regarding retail customers: Are you targeting a general age demographic? What other personal demographics, such as ethnicity, race, or gender, characterize a majority of your target audience? How price sensitive is your average customer? Note that the New York City gourmet shopper is likely to have a different price point in mind than the rural or suburban farmers' market customer. Is your customer type buying on behalf of someone else, as in the case of a mother shopping for her family? In this case, she may be very concerned about nutritional information, pricing, sales and promotional events, and so on. Is your product a "luxury" product (for example, locally made, hand-churned ice cream) or more of a necessity (such as commodity milk but one marketed in glass bottles)? Is your product seasonal, such as ice cream? To some extent, product characteristics will help you identify the volume and type of customers, as well as how frequently they purchase the product.

• Are you targeting a general age demographic?
• What other personal demographics, such as ethnicity, race, or gender, characterize a majority of your target audience?
• How price sensitive is your average customer? Note that the New York City gourmet shopper is likely to have a different price point in mind than the rural or suburban farmers' market customer.

• Is your customer type buying on behalf of someone else, as in the case of a mother shopping for her family? In this case, she may be very concerned about nutritional information, pricing, sales and promotional events, and so on.

• Is your product a "luxury" product (for example, locally made, hand-churned ice cream) or more of a necessity (such as commodity milk but one marketed in glass bottles)?

• Is your product seasonal, such as ice cream? To some extent, product characteristics will help you identify the volume and type of customers, as well as how frequently they purchase the product.

You may find through research that providing variety is important to meeting customer needs.

### Distribution

Many small-scale processors focus on the product development and processing stages. Choosing to both milk animals and then process a value-added dairy product is no small feat. However, the product must be sold before you can claim new product success. Physical product movement, from farm to market, is a necessary consideration and one over which you have some choice.

Distribution addresses moving the product from you to the buyer. The buyer may be a distributor who assumes ownership of the product, a wholesaler who does not assume ownership, a retailer, or a farm-to-market program coordinator.

To help decide to outsource distribution services or assume them yourself you'll want to consider a handful of factors, including issues related to time and dollar constraints, market size, and distance from farm/processing location, and your own affinity for handling distribution activities. The following points are designed to help you think through the distribution decision:

• **The time commitment.** While it may be easy to overlook the time commitment of delivering your product to market, it is a critical consideration. Product distribution can be particularly time consuming where a very small number of laborers are responsible for both milk production and product processing. Assuming distribution responsibilities during the start-up phase may appear cost effective in dollar terms, but it will likely introduce additional time constraints on an already tight on-farm
labor supply.

- **The labor commitment.** Do you have additional labor available to deliver product to market? Initially, you may have little to no extra help available to dedicate to delivery efforts. You may also have a strong preference for staying on the farm to manage and oversee production. If this is the case, you may be more willing to outsource distribution responsibilities. Time, product success, enterprise expansion, and changing preferences in task responsibilities may influence this time-cost relationship. Subsequently, you may find that periodically reevaluating these issues is helpful and can mitigate potential distribution challenges before they occur.

- **The capital/equipment commitment.** The type of vehicle you need for distribution will largely be determined by the volume of product and the distance it must be transported. The primary vehicle consideration is refrigeration capability. For exceptionally close markets, refrigeration may not be necessary at all. In some instances, a traditional refrigeration truck may be necessary. Other times, standard pickup trucks may be adapted or outfitted with small refrigerators to accommodate transporting small volumes to markets or retailers. Check with your state regulatory agency for approval on whatever method you wish to use. In Pennsylvania, this would be the Department of Agriculture. In New York, the Department of Agriculture and Markets Division of Milk Control and Dairy Services oversees these processes.

- **Product characteristics.** Product characteristics help determine allowable time away from refrigeration, the mode of transportation, and the associated cost of moving the product. Product characteristics drive many of the distribution decisions regarding delivery transit time, delivery frequency as it relates to shelf life, and transportation mode. Fresh products with shorter shelf life (e.g., raw milk, yogurt, or fresh cheeses) require greater attention to product freshness relative to an aged, long-life cheese. Products with shorter shelf lives also require faster inventory-turnaround times. Regardless of product type, however, spoilage concerns must be addressed.

- **Market outlet characteristics.** Market characteristics will influence your distribution decisions to the extent that market size and product volume requirements may simply exceed your self-distribution capabilities. If you're planning on selling directly at farm retail stores, the tradeoff from transportation savings may come in the form of decreased consumer visibility. One strategy to compensate for this may be to develop a Web site through which Internet sales could be handled. If you decide to market online, don't forget to consider how shipping and handling charges will influence product price. In the case of less formal local markets (e.g., farmers' markets and on-farm sales), the cost of hiring a distributor quickly exceeds the benefit, so you will likely want to make deliveries yourself. For the local restaurant or urban market scene, the decision is more complex as distribution expenses and buyer requirements, such as preferred delivery days, time, and volumes, can be numerous.

In short, distributors are in the business of delivering products to market. Their presence in the market indicates that a certain segment of specialty product manufacturers recognize distributor-sourced benefits to be at least as great as the cost of employing them. The question for you is whether these services are economically justifiable in your situation.

Distributors spend much of their time coordinating delivery schedules and volumes to meet product-handling concerns and, at the same time, buyers' needs. Thus, distributors assume a certain level of risk for coordinating the timely delivery of a highly perishable product. Distributor costs must cover transportation, short-term storage expenses, and some degree of product marketing. In addition, distributors' rates also reflect the current fuel price, labor (e.g., driver) rates, proximity to market, product volume, and product characteristics.

One benefit of using distributors is that they can offer increased visibility, via their own customer network, for your product. This is yet another instance where retailer and consumer product appeal is important. Distributors may prove especially valuable to processors of a certain scale wanting to expand their immediate market area. However, the full range of distributors' benefits come at additional expense to the processor. Initially, you may feel that a distributor's service expense exceeds service advantages. The opportunity to capture a greater portion of the marketing dollar is a strong incentive to assume distribution and marketing tasks. However, recall that the decision should center on the resource tradeoffs (e.g., time, availability, labor) that you will incur. Later, we'll review some financial tools that you can use to make this and other important business decisions.

Again, the information-gathering phase may initially seem onerous. However, it is a short-run time investment that will allow you to make a more informed decision in the long run. Ultimately, the distribution decision is about whether or not to hire someone else to distribute your product. The distributor decision ought to be made after careful consideration of your capabilities, the market outlet, and product characteristics.

**Promotion and Advertising**

Marketing any type of product involves first recognizing to which product characteristics your customers respond most strongly and then communicating how the characteristics will meet, if not exceed, their expectations. In general, consumers who are drawn to value-added products are typically less cost conscious. They choose to pay higher prices for product characteristics they value highly, such as quality and uniqueness. The family that chooses to frequent the local ice cream stand for a scoop of homemade product illustrates this idea. The family may well have a half gallon from a nationally recognized manufacturer sitting in their freezer, yet they are willing to pay more per serving to have the local, homemade experience.
Part of the purpose of marketing is to inform customers about a product and its characteristics and then persuade them to buy that product. The best-case scenario involves eager consumers requesting particular products, indicating true market demand. This is in contrast to the producer-processor that must spend a lot of time and dollar resources trying to convince consumers they have an attractive product. Currently, value-added dairy products are riding a wave of consumer interest as buyers look for novelty products that may be local, organic, or handcrafted. The question for you then becomes "how do you effectively promote your product?"

One option is to participate in product competitions. Awards received in a food competition offer an unbiased, objective marketing edge for the producer. Other promotional tactics include offering customers in-store samples and creating savvy packaging and labeling—ance of which have been shown to lure consumers to a product.

Product competitions may be an especially effective way to market to consumers whose expectations regarding specialty product quality and food safety characteristics run a bit higher. Award recognition, as offered by judges at specialty food competitions, establishes unbiased credibility about product quality. Quality recognition in the specialty products market is often the most distinguishing characteristic available to value-added dairy product processors and one that poses relatively small cost to enter. Positive word of mouth is another wonderful and inexpensive marketing strategy since you're basically letting others advertise your product for free.

Relatively speaking, sampling is an inexpensive marketing strategy and offers customers an opportunity to taste the product with the hope of an initial purchase. However, sampling won't guarantee repeat purchases; thus, product quality is a top priority.

Finally, informative and creative packaging helps consumers not only learn about the product but entices them aesthetically as well. For example, sharing information about your farm, such as the year the farm was established, the farm's location, or whether or not processing is done by hand, and something about the farm family itself helps consumers make a personal connection that they may not be able to experience with other products.

The Value of Understanding Price Points

One of the most important questions you'll have to ask is "how much should I charge for my product?" The answer, as in many cases, is "it depends." A successful price point is based on several pieces of information including, but certainly not limited to, the following:

- **Other, similar products' prices.** Using comparable product pricing as a reference is a useful strategy since it prevents you from pricing too high or too low, especially if you're introducing a new product. As you gain information about sales performance, you'll likely adjust your pricing. Using other similar product prices simply helps establish an initial reference point.

- **Your own production and marketing costs.** A second important reference point is your breakeven price, which is the minimum price you could possibly receive from a buyer without losing money on each unit produced. Charging less than your breakeven price means that you will not sufficiently cover your production costs. Note that the break-even price does not generate profit; it simply acts as a minimum pricing threshold that allows you to operate in the very short run.

- **Distribution and marketing costs.** Whether you hire a distributor or self-distribute, knowing the market value of these services allows you to more accurately evaluate a retail price. Without considering distribution and marketing costs, a retail price will cut into your own margin.

- **Point-of-sale feedback.** For their part, retailers have front-row seats with which to observe consumers at the final point of sale. While large urban markets may have attractive retail prices, you must recognize that there are additional distribution and retailing costs incurred from supplying your product to the market. The sum of production, distribution, and marketing costs provides a reference point against which the retail price can be compared and interpreted.

- **Consumers' actual interest level in the product.** If a product is moving quickly with positive point-of-sale feedback, you may want to consider raising the price. You'll want to adjust the price carefully, however, as raising (or lowering) it too frequently or too much in a single price change can drive away customers. Without question, there is an upper limit at which consumers will back off, but how close you are to that limit is an experiment. To a large extent, price adjustments are trial and error and the factors that influence the process, such as customer likes and dislikes, are always changing.

It is worth noting that a key distinction between commodity and value-added dairy product markets is the customers' perception of quality and differentiation. Again, customers are willing to pay a higher retail price for this quality perception. Unfortunately, this higher retail price is often attributed to higher production costs assumed by you. As a result, the challenge for you is to capture as much value as possible at retail while carrying the additional responsibility of marketing a higher-quality product.

For more about pricing value-added products, refer to the Penn State Extension publications *Product Pricing: What Do I Charge?* and *Understanding Pricing Objectives and Strategies: For the Value-Added Ag Producer.*
Summary
As you can see, marketing your value-added dairy product is a very important issue. Understanding your product, the industry, and your potential customers is essential. You must be able to read the market and determine the desires of the public and what drives them to purchase value-added products. Within your business, you will need to make decisions concerning market outlets, distribution, production supply, and product price, among other issues. Your decisions will impact one another, so spend enough time researching and planning your marketing strategy to put yourself one step closer to success.


Chapter 4. Taking Stock of What You Have and Need

Resource Inventories
What do you have and what do you need? These are two important questions when deciding if you should start a business enterprise. Performing a resource inventory will provide you with the answers to these questions. A resource inventory is a list describing all resources, tangible and intangible, that either you have or are available to you to fulfill business needs. Nothing is too big or too small to be listed in your resource inventory. If you have a piece of equipment in the back shed that hasn't been used in twenty years, list it. You never know when you'll suddenly need that certain something. You could save hundreds or thousands of dollars by simply being able to check a list and know that you already have that item.

You may choose how many categories you use when constructing your resource inventory. Typically, the number of categories will be between three and five, depending on how items are grouped. In this publication, we will move ahead with four categories: physical/natural resources, human resources, financial resources, and marketing capabilities.

Your resource inventory will serve as an important tool as you make decisions regarding whether to move forward with a value-added enterprise. It will also aid you in deciding which enterprise is best suited to your situation and objectives. This activity will play a large role in your ability to perform an accurate financial analysis (discussed in the next section). A few of the concrete uses for your resource inventory include completing financial analyses, providing a list of potential loan collateral, and identifying strengths and weaknesses in your resources.

Physical/Natural Resources
Physical resources refer to any tangible assets that are being used in your current business or are available for use in a potential value-added enterprise. Since most of your physical resources are tangible items, you should provide either a known or educated estimate of each resource's value.

Land
You should first describe the location of all land that is either owned or rented by your business. Provide maps that highlight fields and property lines. Also document topography, locations of natural or human-made structures, and soil test results (pH, soil type).

Water
Safe, secure, and readily available water sources can be an extremely valuable resource for your business. In addition, weather patterns can affect production performance of both animals and crops. Document average monthly rainfall amounts, weather patterns, and location of ponds or streams. Also note the seasonal availability of water from these sources, water quality (minerals, bacteria, etc.), and possible contamination sources.

Equipment and Machinery
Equipment and machinery are among your business's most capital-intensive resources. Efficient use of these resources is critical to profitability. Therefore, knowing what equipment and machinery you have available is essential. Document the size, age, and condition of all equipment, from the largest and most used to the smallest and least used. Also note whether the equipment is owned, leased, or borrowed, its market value, and any new technologies that provide advantages over similar equipment.
Facilities
In addition to normal production facilities, value-added dairy enterprises typically require facilities not normally found or used in commodity milk production. The resource inventory process will allow you to document and describe the facilities you currently have, giving you the ability to see which, if any, buildings can be used to meet the additional facility needs of a new enterprise. To make things easier when assessing future needs, you may want to group current facilities by both current and potential production, storage, and retail uses. Describe the size, layout, condition, location, and value of each facility.

Other Assets
Other assets you may possess include information management systems, animals, and crops. For any animals, list the number of breeding and nonbreeding stock you have along with market values. Also make note of important characteristics they possess, such as organic certification. For crop assets, outline the total number of acres, amount in storage, market value, history of yields, and history of government payments.

Human Resources
People are the most overlooked resource in business. You and your employees, whether they're family or not, are the heart of your business. Without workers, animals aren't fed, machinery can't run, and land is not worked. When you perform your resource inventory, try not to overlook any person that works for you or is involved in your business in any capacity (full time, part time, seasonal, custom hire, volunteer, advisers, family, or nonfamily). For each person involved in the business, describe their skills, responsibilities, and how they function within the business. Specifically, note each person’s production-related skills and responsibilities, management responsibilities (e.g., operations, human resources, finance), sales skills, and interpersonal skills.

In addition to these qualities, list the salary or wage level and work schedule for each person. You’ll want to know if you have enough employee hours for a new enterprise and how increasing or decreasing workloads will impact labor expenses. Finally, outline the decision-making structure that you currently have for your business. This includes laying out who (or what position) is responsible for making certain decisions and when decisions need to be taken to a superior.

Your human resources do not need to reside solely within your employee pool or family. Who else do you ask for information or advice? What sources of information are available to you? These people may include your accountant, lawyer, insurance agent, and so forth--anyone that helps you with the big-picture evaluation of your business.

Financial Resources
Financial stability, or at least an understanding of where your business stands financially, is crucial when embarking on a new enterprise. Take a complete accounting of all your financial resources, both what you have and what may be available to you. This will include equity, borrowed moneys, and grants. For each resource, list equity (cash in savings and checking accounts; longer-term investments such as CDs and mutual funds), borrowed moneys (for debts, list amount owed, interest rate, and loan term; for credit available, provide limits and terms), and grants (list sources, limits, and terms).

Marketing Resources
Understanding your resources as they relate to possible future marketing of any value-added product or enterprise is important. Many of these considerations relate to the location of your farm business to potential marketing outlets and the feasibility of on-farm marketing. Earlier in this publication we discussed marketing in more detail. Use the information learned and decisions made after reading that section when you analyze the information from performing this marketing resource inventory.

- How and where would you like to market?
- Where is it realistic to market?
- Does your farm have roadside frontage? If so, how much?
- Is the location suitable for a roadside retail market (i.e., is it sloped, flat, prone to flooding)?
- Is it suitable for parking (i.e., is it accessible)?
- What is the farm’s proximity to desired markets?
- How much and at what time of the day does traffic pass the farm?
- Is there easy access to and from main roads or highways?
Who Can Help?

Inventorying everything listed up to this point must certainly seem daunting. However, there is no need to compile your resource inventory on your own. Take advantage of the many people on which you already rely for business assistance, such as family members, employees, lenders, extension educators, and other experts like lawyers and accountants. Call on these individuals as you need them.

Matching Resource Inventories to Resource Needs

Up to this point, we've only discussed taking an inventory of resources in your possession or that you have available to you. To choose a value-added enterprise, you must compare the resources you have with those you will need or that are required for the enterprises under consideration. This means you will basically need to perform a second resource inventory.

To perform resource assessments for potential enterprises, you can follow the same format used for your resource inventory. It should be obvious that resource assessments will require a great deal of research into all aspects of potential enterprises--everything from production to marketing to distribution. You will probably already be familiar with some information simply from knowing that it is an enterprise you wish to consider. Knowing and understanding the requirements of all aspects, though, will allow you to make the most educated enterprise selection decision possible as well as provide a large majority of information needed to prepare your business plan.

When you have completed your resource inventory and all resource assessments, you are in a position to compare each assessment to your inventory. Ideally, you will choose to move forward with the enterprise that most closely aligns current resources with needed resources. However, knowing that your resource inventory will not likely match up perfectly with one or more resource assessments for possible enterprises, you will need to take a closer look at the resources that you don't have but will need. For each of these resources, investigate whether it is something that you can acquire. Sometimes this will mean purchasing the item, while other times you may be able to borrow or rent the needed item.

Summary

Performing a resource inventory can be a very tedious activity, but it is also very important. Your inventory will show you the resources you have and those available to you as well as those resources you need to obtain for various value-added enterprises. It's possible that some products you are considering may be crossed off the list after discovering that you would need to invest heavily in equipment or employees, thus decreasing the profit potential. On the other hand, you may discover that you already possess the equipment needed to quickly and profitably enter into the production of a certain item. In addition, an accurate and complete resource inventory will set the stage for completing a variety of financial analyses (discussed in the next chapter).

Chapter 5. Capturing the Profit Potential

Financial Tools

By now you've learned a lot about producing and marketing value-added dairy products. You have many alternatives from which to choose. Should you make ice cream or yogurt? Should you sell it through your on-farm shop or specialty stores? Should you even take the step into the value-added dairy world? These and other important questions can be tough to answer because you have to consider many different aspects.

- What physical resources do you need to produce a given product?
- How will you market your product(s)?
- What human resources do you need? That is, do you have the proper expertise to produce and market value-added dairy products?
- How will you finance your business during the growth of your value-added enterprise?

While these are sometimes difficult to assess individually, successful business owners need to think about the interaction of production, marketing, financing, and human resources management. Your cost of producing a pint of ice cream depends on how you've financed your business as well as your labor costs. In turn, the price you will charge depends on your production costs. Therefore, although it can be simple to look at marketing or production as individual areas, they are most definitely connected.

A number of tools will help you analyze these complex choices in the context of financial analysis. In the end, profitability—not simply the quality of cheese you produce—will determine success. Therefore, you should assess the profit levels that you might reasonably expect before you invest in processing equipment, storage capacity, new trucks, and so forth. The purpose of this section is to introduce three financial tools you can use to make decisions under your unique circumstances. While many producers are more comfortable discussing production and processing of their dairy products, using these basic financial tools can help all
producers identify potentially profitable enterprises and avoid costly mistakes. If used correctly, these tools help you tie together all the considerations presented in this publication.

It is important to note that with each of these tools, you are making some guesses, or projections, about the future. A budget is simply a plan that looks at how much money you can expect to receive and how much you can expect to spend. The better your projections are, the better chance you have of making a good decision. If you already have a dairy business and are exploring value-added options, you may have an excellent foundation for a budget in your farm records. If you are considering an entirely new venture, then collecting the appropriate information may take a bit more work. Either way, we provide some guidance on what you need to analyze and where you can find the information you will need.

**Enterprise Budgets**

One of the best decision tools you can use is an enterprise budget. In this case, the costs and returns are related to one or more individual farm business enterprises. In this section, we discuss how to construct and analyze an enterprise budget, which will serve as the foundation for the other analytical tools provided later.

Developing a budget for each of your business enterprises allows you to assess the profit potential of each. In this context, an enterprise is defined by the item being produced. A dairy farm often has at least three enterprises: milk, feed, and replacements. However, the feed enterprise could be divided into several other enterprises. For example, alfalfa hay, corn, and soybeans might all be grown on the same farm. Budgeting them as feed might be handy, but you will also lose some information about the profitability associated with each of the three subenterprises. How you define your enterprises will depend on how you wish to use the information. You can add as much detail as you need.

One common question that arises relates to the use of farm-grown inputs. For example, what if farmers use their own milk to make their ice cream? Is the milk "free"? Absolutely not! The best thing to do is to apply a market value to the milk, treating it as a sale from the dairy enterprise to the ice cream enterprise. In this way, it is income to the milk enterprise and a corresponding cost to the ice cream enterprise. The costs and income cancel each other out when budgets are aggregated. But this treatment allows you to see if each enterprise is profitable. By adding a market value for milk in your dairy budget, you will be able to see if you are profitable. If it costs you more to produce milk than buy it on the market, your dairy enterprise is unprofitable.

Once you have identified the enterprises you wish to analyze, you are ready to develop your budgets. (Table 3 provides a standard budget format.) Generally, enterprise budgets contain major sections for revenues, variable costs (or "expenses"), fixed costs, and net income.

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Table 3. Standard enterprise budget format.
Revenues
Most producers understand what revenues are. These represent the money that comes into the farm business as a result of selling the output from the enterprise. In many cases, only one revenue stream may exist. Depending on your enterprise, revenues might be generated from milk income, crop sales, ice cream sales, and so on. For example, if you are in the ice cream business and you want to take a close look at income from different flavors, you could have a number of revenue items, one for each flavor. (If you wanted to take a really close look, though, you might have separate enterprise budgets for each flavor of ice cream.)

Variable Costs
Although revenues are well understood, people often find it difficult to distinguish between variable costs and fixed costs. The difference is that variable costs are realized only if production occurs. Variable costs fluctuate depending on how much you produce as well. In your milking enterprise, for example, these include items such as feed, vet expenses, milking labor, and breeding costs. For a yogurt enterprise, these may include milk, cultures, flavoring, and containers.

In general, variable costs are incurred for direct inputs. If you are selling packaged cheeses, for example, what items will you need to produce your cheeses? You will need labor, milk and other cheese ingredients, and packaging materials, if you actually produce cheese. Thus, they are variable costs. If you are thinking you need more than these things to produce cheese, you are correct. You also need special equipment and machinery. However, those related expenses are considered fixed costs.

Fixed Costs
Fixed costs are incurred whether or not you produce a product in a given period. Think about your milking enterprise again. Even if you don't produce milk in a given period, you still own a barn, milking equipment, and other assets that would be needed if you did produce milk. Also, other costs, such as some insurances and taxes, are incurred even when production does not occur. These are accounted for as fixed costs.

Allocating fixed costs can be difficult. For some specialized equipment, such as a cheese press, it might be easier since depreciation expenses are fixed costs for this type of fixed asset. The depreciation schedule, which you can develop yourself or obtain from your accountant, will tell you what the expense is to be. How can you accurately estimate the amount of the business's insurance expenses to allocate to the cheese enterprise, particularly in a highly diversified business? It becomes difficult, no doubt. Ultimately, you will need to make a decision about how to do it and stick with that choice. One possible choice is to exclude some fixed costs from your budget. If you do this, keep in mind that the business must still pay those costs. You simply may not be comfortable with charging them to a particular enterprise. This avoids the problems associated with allocating fixed costs. It works as long as you don't forget that those costs are real and must be paid.

Net Income
Most people readily understand the term "net income," which is simply the total revenues for the enterprise minus the costs of production. This figure tells you if the enterprise is adding to the business's profit or taking away from it. When all fixed costs are not included in the enterprise budget, the bottom line does not reflect net income. Rather, it reflects a "contribution margin." That is, revenues minus variable costs indicate how much the enterprise contributes to the payment of total fixed costs and profits.

Constructing Your enterprise Budgets
For those who know the production process for their enterprise, constructing a budget is fairly easy. If not, building a sound budget is a very good way to learn about the processes needed to produce your items. Follow these simple steps to construct your enterprise budget:

1. Identify the inputs needed to produce and market your item. This might include land, labor, supplies, product ingredients, packaging materials, processing equipment, and other things. As you do this, indicate the units by which each input is measured. For example, land is usually measured in acres, labor in hours, and so on.

2. Specify the number of units needed for each input. If you are making cheese, how much rennet will you need? If making butter pecan ice cream, how many pounds of pecans are needed? Do this for each input. It might be difficult to accurately allocate some inputs, such as labor hours, to a given enterprise, but do your best to estimate it. The better your numbers, the more likely you will be able to make a good decision.

3. Estimate the price per unit of each input. Remember, this is a plan for the future. So do your best to figure out what price you can expect. For some things, your best guess might be to use the current price. For commodities, such as grains, you might want to use a price from a futures market. For other items, your best guess might be found by asking others in the industry. Either way, use a number that you can justify in some way. None may be exact, unless you have a contract for a given input, but it's best to be close.
4. Once you have the price per unit and the number of units you will use, multiply those two values to get the total expense for each input.

You can develop your budget by using either a pencil and paper or a computer spreadsheet. The advantages of using the computer include automatic calculations and the ability to change numbers easily and format your budgets for printing. No matter how you choose to do it, developing a budget enterprise is important.

**Calculating Breakeven Price and Production**

Once you have an enterprise budget, you can develop a breakeven price and production estimates. These are very useful for making production and pricing decisions. A breakeven price indicates the price you will need to receive, given a production level and your estimated costs, to break even (that is, have zero net income). Similarly, a breakeven production level indicates how many units of output you must sell, given a price and your estimated costs, to break even.

The calculation of each item is simple. The breakeven yield is simply equal to your total cost divided by your estimated price. The breakeven price is equal to your total cost divided by your expected production level.

\[
\text{breakeven yield} = \frac{\text{total enterprise cost}}{\text{estimated price}}
\]

\[
\text{breakeven price} = \frac{\text{total enterprise cost}}{\text{expected production level}}
\]

Let's look at two very simplistic examples. Suppose your total cost is $10,000 and you want to sell your milk for $17.50 a hundredweight. Your breakeven production is 571.4 hundredweights (10,000 ÷ 17.50). On the other hand, if your total cost is the same and you want to find out what minimum price you would need to charge if you had 390 hundredweights, you would divide 10,000 by 390, arriving at a price of $25.64. For more on developing and using enterprise budgets, refer to the appropriate resources at the end of this publication.

**Partial Budgets**

A partial budget is similar to an enterprise budget but with some very important differences. First, the goal in partial budgeting is to assess the profitability impacts that might result from a small change in farm business operations. For example, maybe you are considering switching from producing ice cream to producing cheese. A partial budget analysis can help you make a good decision about such a change by allowing you to carefully think through the costs and benefits associated with the change. In partial budget analysis, the only things to estimate are those items that are different as a result of the change. If you will use the same amount of milk or labor for cheese as you did for ice cream, then those are not included in the partial budget analysis. (If you do include them, your analysis will not be wrong; they will simply cancel each other out.)

A benefit can take the form of either an increase in revenues associated with the change or a decrease in costs. On the other hand, a cost can also take one of two forms: either a loss of revenue or an increase in costs. Table 4 may help clarify the distinction.

<table>
<thead>
<tr>
<th>Project Benefits</th>
<th>Project Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Added Revenues</td>
<td>Added Costs</td>
</tr>
<tr>
<td>Item 1</td>
<td>Item 1</td>
</tr>
<tr>
<td>Item 2</td>
<td>Item 2</td>
</tr>
<tr>
<td><strong>Total Added Revenues</strong></td>
<td><strong>Total Added Costs</strong></td>
</tr>
<tr>
<td>Reduced Costs</td>
<td>Reduced Revenues</td>
</tr>
<tr>
<td>Item 1</td>
<td>Item 1</td>
</tr>
<tr>
<td>Item 2</td>
<td>Item 2</td>
</tr>
<tr>
<td><strong>Total Reduced Costs</strong></td>
<td><strong>Total Reduced Revenues</strong></td>
</tr>
<tr>
<td><strong>Total Benefits</strong></td>
<td><strong>Total Costs</strong></td>
</tr>
</tbody>
</table>

Table 4. Standard partial budget format.

New revenue resulting from cheese production is a benefit associated with the change. That should be listed in the upper-left portion of Table 4. However, you may also be avoiding some costs by making this switch. Maybe you will no longer use some of the flavoring ingredients. Avoiding these costs is also a benefit associated with the change. The value of these items should be listed in the bottom-left portion of Table 4. The sum of these items represents the total benefits of the change.
Each change will also have costs. One type of cost arises from the costs associated with the new project. Keep in mind that these costs are only counted in partial budget analysis if they are different from the current situation. Maybe you are currently wholesaling your cheese but are looking into developing a retail component by selling online. All the costs associated with producing cheese are likely to be the same and therefore aren't included in your partial budget. However, the costs of selling online, including new marketing materials, are different from the current situation. Therefore, these will need to be included.

The other type of cost associated with the new project represents a loss of revenues from the old project. Going back to the previous example, the loss in revenues from the wholesale operation represents a cost here. Be careful in thinking through the appropriate costs and benefits for your situation.

Once you have identified and estimated each of the components of costs and benefits, simple addition allows you to determine whether you can expect the change to be profitable. Simply add up the benefits to calculate your total benefits. Then do the same to determine your total costs. If the project's total benefits outweigh its total costs, then you can expect your profits to increase if you implement the change. Of course, always keep in mind that you are projecting the future. The actual results may be different from your forecast. Doing the best job of forecasting now will increase the chances that your decision is a good one.

The nicest part of partial budgeting is that it is a pretty simple tool to use. The key to using the tool properly, though, is being thorough and accurate. Before you start filling in dollar amounts, be sure you have accurately identified the cost and benefit items that result from the change you are analyzing. If you do that and then carefully identify the dollar values associated with each of those, your partial budget analysis will be sound.

**Investment Analysis**

Investment analysis tools, such as the one described below, are the most complex of those discussed in this publication. However, as with enterprise and partial budgeting, you can use them successfully if you follow the process outlined.

Two key things make investment analysis different from the tools described earlier. First, investment analysis takes a longer-term view of the decision. We use investment analysis to look at decisions related to large capital investments. In the value-added dairy context, that may mean an investment in the equipment and facilities needed to bottle milk or make ice cream, for example. The life expectancy of the equipment may be many years. Therefore, we look at the entire life of the project.

Second (but related), because the decision is based on expectations of what may happen beyond one year in the future, the issue of “discounting” must be addressed. That is, we must explicitly address the fact that a dollar in your pocket today is worth more than a dollar you may receive or spend in the future. Ask yourself whether you would rather receive $100 today or a year from now? Clearly, we'd all rather have it today. Your decision might differ if the question were “would you rather have $100 today or $110 a year from now?” Some might choose the money now, while others might be willing to wait for the higher payout. Fundamentally, that's the discounting issue. Applying a discount rate converts future dollars into the value they have today. Economists call this the "time value of money." Later, we'll see how this enters into the analysis.

Developing a solid understanding of investment analysis might be easiest through the use of an example. Therefore, we've developed a simple scenario.

**Nittany Dairy: To jug or not to jug?**

Gary and Sarah at Nittany Dairy are thinking of developing a milk jugging enterprise, with product to be sold through a neighbor's farm market. They have an opportunity to purchase all needed equipment, which they expect to last for ten years, for $175,000. They estimate their costs and returns as shown in Table 5.
Table 5. Estimated costs and returns of Nittany Dairy's investment in milk jugging.

<table>
<thead>
<tr>
<th>Year</th>
<th>Benefits Totals</th>
<th>Costs Totals</th>
<th>Net Income</th>
<th>Marketing Materials</th>
<th>Labor</th>
<th>Transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$38,000</td>
<td>$7,000</td>
<td>$45,000</td>
<td>$10,000</td>
<td>$2,000</td>
<td>$3,000</td>
</tr>
<tr>
<td>2</td>
<td>$38,000</td>
<td>$7,000</td>
<td>$45,000</td>
<td>$10,000</td>
<td>$2,000</td>
<td>$3,000</td>
</tr>
<tr>
<td>3</td>
<td>$38,000</td>
<td>$7,000</td>
<td>$45,000</td>
<td>$10,000</td>
<td>$2,000</td>
<td>$1,000</td>
</tr>
<tr>
<td>4</td>
<td>$38,000</td>
<td>$7,000</td>
<td>$45,000</td>
<td>$10,000</td>
<td>$2,000</td>
<td>$500</td>
</tr>
<tr>
<td>5</td>
<td>$38,000</td>
<td>$7,000</td>
<td>$45,000</td>
<td>$10,000</td>
<td>$2,000</td>
<td>$500</td>
</tr>
<tr>
<td>6</td>
<td>$38,000</td>
<td>$7,000</td>
<td>$45,000</td>
<td>$10,000</td>
<td>$2,000</td>
<td>$500</td>
</tr>
<tr>
<td>7</td>
<td>$38,000</td>
<td>$7,000</td>
<td>$45,000</td>
<td>$10,000</td>
<td>$2,000</td>
<td>$500</td>
</tr>
<tr>
<td>8</td>
<td>$38,000</td>
<td>$7,000</td>
<td>$45,000</td>
<td>$10,000</td>
<td>$2,000</td>
<td>$500</td>
</tr>
<tr>
<td>9</td>
<td>$38,000</td>
<td>$7,000</td>
<td>$45,000</td>
<td>$10,000</td>
<td>$2,000</td>
<td>$500</td>
</tr>
<tr>
<td>10</td>
<td>$38,000</td>
<td>$7,000</td>
<td>$45,000</td>
<td>$10,000</td>
<td>$2,000</td>
<td>$500</td>
</tr>
<tr>
<td>Total</td>
<td>$450,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If we look simply at the costs and returns of this investment, the net income over ten years is $280,000—well above the $175,000 it will cost to get started. In fact, investing the $175,000 provides a total net return of $105,000 over ten years ($280,000 - $175,000). But, we haven't yet considered the discounting. What is the investment really worth if we build in the time value of money? Would our decision be any different? Table 6 provides some answers.

Table 6. Discounted net income for Nittany Dairy's investment.

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Income</th>
<th>Discount Factor (10%)</th>
<th>Discounted Net Income (10%)</th>
<th>Discount Factor (8%)</th>
<th>Discounted Net Income (8%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$24,250</td>
<td>0.91</td>
<td>$22,045</td>
<td>0.93</td>
<td>$22,454</td>
</tr>
<tr>
<td>2</td>
<td>$26,250</td>
<td>0.83</td>
<td>$21,694</td>
<td>0.86</td>
<td>$22,505</td>
</tr>
<tr>
<td>3</td>
<td>$28,750</td>
<td>0.75</td>
<td>$21,255</td>
<td>0.79</td>
<td>$22,426</td>
</tr>
<tr>
<td>4</td>
<td>$28,750</td>
<td>0.68</td>
<td>$19,637</td>
<td>0.74</td>
<td>$21,132</td>
</tr>
<tr>
<td>5</td>
<td>$28,750</td>
<td>0.62</td>
<td>$17,851</td>
<td>0.68</td>
<td>$19,567</td>
</tr>
<tr>
<td>6</td>
<td>$28,750</td>
<td>0.56</td>
<td>$16,229</td>
<td>0.63</td>
<td>$18,117</td>
</tr>
<tr>
<td>7</td>
<td>$28,750</td>
<td>0.51</td>
<td>$14,753</td>
<td>0.58</td>
<td>$16,775</td>
</tr>
<tr>
<td>8</td>
<td>$28,750</td>
<td>0.47</td>
<td>$13,412</td>
<td>0.54</td>
<td>$15,533</td>
</tr>
<tr>
<td>9</td>
<td>$28,750</td>
<td>0.42</td>
<td>$12,193</td>
<td>0.50</td>
<td>$14,382</td>
</tr>
<tr>
<td>10</td>
<td>$28,750</td>
<td>0.39</td>
<td>$11,084</td>
<td>0.46</td>
<td>$13,317</td>
</tr>
<tr>
<td>Total</td>
<td>$280,000</td>
<td></td>
<td>$170,124</td>
<td></td>
<td>$186,208</td>
</tr>
</tbody>
</table>

Note: Some numbers have been rounded.

Table 6 contains the net income amount for each year as shown in Table 5. We also show the values of the net income if we use two different discount rates. When using a 10 percent discount rate, the present value of the net income is only $170,124. This is below the investment cost. Therefore, if the decision maker chooses a discount rate of 10 percent, then this investment is not profitable. At an 8 percent discount rate, the present value of the investment is $186,208. Because this exceeds Gary and Sarah's investment cost, the investment is profitable. You might be wondering how the same investment can be profitable to some but not to others. We'll discuss that point a little later. The discount factors show how much each future dollar is worth given our valuation of today's dollars. If we discount by 10 percent, then $100 received one year from now is worth only about $91 today. At an 8
percent discount rate, that same $100 is worth about $93 today. The discount factor can be calculated easily once a discount rate, which we'll call $D$, is chosen. The discount factor one year from now is equal to $1$ divided by the sum of $1 + D$. If the discount rate is 10 percent, then this equals $1 \div 1.1$, or 0.909. The discount rate for two years from now is found by discounting the one-year factor again:

$$0.909/1.1 = 1/(1.1)(1.1) = 1/(1.1)^2 = 0.826$$

Simply continue this for each time period. This might seem complex, but computer spreadsheets make these very easy to calculate.

**Selecting a Discount Rate**

As should be evident by the example, the investment is considered to be profitable if the total discounted net income exceeds the investment's initial cost. The difference in these two things is often referred to as the investment's net present value. Using that language, the investment is profitable if the net present value is positive. But it seems odd that the analyst's choice of a discount rate makes an investment profitable or not. So, let's briefly discuss the importance of selecting a reasonable discount rate.

As noted above, the discount rate reflects the fact that future dollars are less valuable than present dollars. Your selection of a discount rate reflects how much more valuable current dollars are to you. Are they 3 percent more valuable? Fifteen percent? Somewhere in between? The choice of a discount rate is highly personal. In fact, economists often argue among themselves about what the "right" discount rate should be for a given project. In the end, the choice is yours and should reflect the following considerations:

1. What sort of return do you expect on your investments? Are you content with placing money into a savings account earning maybe less than 2 percent, or do you like to invest in something like stocks that, although more risky, typically experience returns in excess of 10 percent?

2. If applicable, what returns are you currently realizing from your farm business? Take a look at your return on assets or return on equity. You might say that you expect at least the same percentage returns from this investment as you get in other parts of your business. So the return you calculate from other enterprises might be a good discount rate for you.

3. How risky is the project? The riskier the project, the higher the discount rate should be. Raising the discount rate lowers the discounted net income and, as a result, the net present value is lower. Imposing a high discount rate due to expected riskiness of investment forces the expected returns to be very high for you to make a positive decision to invest.

4. What is the current inflation rate? In periods of high inflation, the buying power of money is eroded more quickly than when inflation is low. Therefore, discount rates should be higher when inflation is expected to be high. For this point, it is very important to keep in mind that inflation pressures may be different for your project than for the general public. Between about 2002 and 2006, real estate experienced a generally high inflation rate. This was not reflected in broader measures of inflation, such as the Consumer Price Index, however. So, if your investment included real estate, it may have been important to account for the inflation in that area even though other prices were relatively stable.

5. How are you financing the investment? If you are putting your own equity into the investment, then the discount rate should be higher than if you are borrowing capital. Using debt, you know what interest rate you'll have to pay. That interest rate places a lower bound on the discount rate. If using equity, you might be able to achieve returns well in excess of 10 to 12 percent in other investments, so that should be reflected in your discount rate.

As you can see, the choice of a discount rate is entirely yours and should reflect your personal situation as well as your level of comfort with risk. We can't tell you what the "right" rate is for you, but we can say that rates between 8 and 10 percent are commonly used. Many demanding businesses might expect returns well above 10 percent, however. Therefore, they often choose discount rates in the range of 12 to 15 percent or higher.

**Summary**

If you are reading this, you are probably seriously considering a value-added dairy venture. Regardless of your starting point, whether you are already in the dairy business or not, this is a very important decision with potentially large consequences. You will likely spend a great deal of time over weeks or months learning about the production technology, what facilities are needed, how to market your products, and what laws or regulations may apply to your situation. Without a doubt, that is all very important. But keep in mind that, as a business, you will need to ensure that the value-added venture is profitable. Of course, no amount of planning can guarantee profitability, but using the tools described here will increase your odds of making the right decision.
Chapter 6. Pulling Everything Together

Value-added dairy production is all about finding ways to increase your dairy business profitability. How you achieve that will vary depending on your interests, abilities, resources, and the market you can tap into. To succeed, an entrepreneurial spirit is required. You will be faced with many tough decisions that will impact current and future operations and all aspects of the business, from processing to human resources to financial management and so forth. The thought you put into the choices you make and the research, preparation, and analysis you do are integral to the start-up and management of a value-added dairy enterprise.

This publication has introduced many value-added dairy products you might consider producing. One of the primary decisions you will face is whether you will pasteurize your milk. Pasteurization allows you to produce and sell soft dairy items (butter, yogurt, and soft cheeses such as ricotta and mozzarella). The equipment needed to produce each dairy item was also covered. However, it is always a good idea to check with your state's regulatory agencies--in most cases, the state Department of Agriculture--to ensure that you satisfy all regulations and guidelines before investing in equipment. Failure to produce dairy items with approved equipment could result in having a stock of product that you are unable to sell, causing significant money loss and putting your business at risk. Make no mistake though, the process of choosing a value-added dairy item to produce allows you to look at your skills and talents and can be an exciting process.

Marketing is an integral component of all value-added enterprises. Not only do you need to research and assess your market options before beginning production, you must also effectively market your product to your target market population to create and maintain sales. How well you are able to market your value-added dairy product will, to a large extent, determine your enterprise's success (or failure) and profitability. Marketing is a wide and complex topic. We have attempted to touch on many of its aspects, from research to distribution to pricing. However, you would be well served to educate yourself further on this topic. Numerous resources are available, including publications, extension workshops, conferences, and so forth.

Performing a resource inventory is a perfect place to begin your adventure into value-added dairy. Assessing the resources you have at hand and others to which you have access can assist you in your decision making and planning. The inventory you develop can help you decide which product(s) you may want to consider processing as well as knowing where you will need to make investments. You should cover all aspects--including physical/natural, human, financial, and marketing resources--when performing your inventory. You may be surprised to find what you have available to you.

The proper use of financial tools is essential for determining whether the choices you are considering are profitable. Financial analysis becomes even more critical to your business when starting a value-added enterprise since you are not guaranteed a sale of your product as you are when shipping fluid milk to a cooperative. Use the financial tools described here not only when starting your value-added enterprise but also when making changes to your marketing strategy, pricing, or to help decide whether to purchase a piece of equipment or change from black and white to colored product labels--all decisions that financially impact your business. You need to know how changes in strategy or unexpected expenditures will impact profitability. It could well be the difference between continuing with this new enterprise for years to come or having to close up shop.

The production of value-added dairy products allows for a vast array of business opportunities, and careful planning can make the difference between success and failure. We hope that this publication will help you tackle the opportunities that exist. Most importantly, we hope you develop a profitable and sustainable value-added dairy enterprise, should you choose to follow that path.

Resources

Publications and Articles

Universities
The Pennsylvania State University Department of Food Science Short Courses and Workshops 814-865-8301
University of Vermont Vermont’s Institute for Artisan Cheese Burlington, VT 802-656-8300
University of Wisconsin Center for Dairy Research Babcock Hall 1605 Linden Drive Madison, WI 53706-1565 608-262-5970
Washington State University Creamery PO Box 641122 Pullman, WA 99164-1122 800-457-5442

State Departments of Agriculture
Connecticut 800-861-9939
Maine 207-287-3871
Maryland 410-841-5700
Massachusetts 617-626-1700
New Hampshire 603-271-3551
New Jersey 609-292-6931
New York 800-554-4501
Pennsylvania 717-787-4737
Rhode Island 401-222-2781
Vermont 802-828-2416

Equipment Suppliers
Cheese Production Equipment
C. van't Riet Dairy Technology-USA 70 Treasure Lake DuBois, PA 15801 814-591-6979

Milk Processing Equipment
Heritage Equipment Company 900 Heritage Drive Plain City, OH 43064 614-873-3941
Rowlands Sales Company, Inc. Butler Industrial Park PO Box 552 Hazleton, PA 18201-0552 570-455-5813
Pladot Mini Dairy

Other
Cheese Supply PO Box 31125 Bellingham, WA 98228 866-205-6376
Dairy Foods Consulting Peter Dixon Putney, VT 802-38704941
Glengarry Cheesemaking and Dairy Supply, Ltd. RR #2 21048 Con 10 Alexandria, Ontario, Canada K0C 1A0 or PO Box 92 Massena, NY 13662 888-816-0903
New England Cheesemaking Supply Company PO Box 85 Ashfield, MA 01330 413-628-3808
Northeast Center for Food Entrepreneurship at the New York Food Venture Center Cornell University/NYSAES Food Research Lab 630 W. North Street Geneva, NY 14456 315-787-2273

USDA Dairy Product Standards
Prepared by Sarah Cornelisse, Roth, senior extension associate, Penn State; Angela Gloy, extension associate, Cornell University; Jeffrey Hyde, professor of agricultural economics, Penn State; and Brian Kelly, Former Penn State Extension educator.