

Opportunities for Veterinarians in the Artisan Cheese Industry

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Abstract

Production of niche dairy products such as artisanal cheese, specialty butter, and other value added products is a growing segment of the dairy industry. Niche dairy producers are often well educated individuals knowledgeable about production and marketing of their product, but lacking in experience with animal production. In addition, their small size often means that niche producers have not had the opportunity to develop a relationship with professionals used to provide services to production dairies.

With their broad based knowledge in areas of animal health, milk quality, nutrition, and food safety, veterinarians have many opportunities to provide both traditional and novel services to niche dairies. Veterinarians interested in this industry should become familiar with the cheese making process and the effects milk quality and nutrition can have on cheese production and food safety. Practitioners interested in this segment should also become comfortable with goat dairies and the unique opportunities they present. Veterinarians may learn about artisanal cheese and other value added products by becoming a member of the many producer groups that have become established.

Résumé

La production de produits laitiers de niche comme le fromage artisanal, le beurre de spécialité et d'autres produits à valeur ajoutée est un créneau de l'industrie laitière en pleine croissance. Les producteurs laitiers de niche sont souvent bien éduqués et au courant de la mise en marché et de la production de leur produit mais ils ont souvent moins d'expérience avec la production animale. De plus, leur petite taille fait souvent en sorte que les producteurs de niche n'ont pas la chance de développer un lien avec les professionnels qui offrent leurs services aux fermes laitières.

En raison de leur connaissance générale dans le domaine de la santé animale, de la qualité du lait, de l'alimentation et de la sécurité des aliments, les vétérinaires sont bien placés pour fournir des services traditionnels et plus spécialisés aux fermes laitières de niche. Les vétérinaires qui s'intéressent à cette industrie devraient se familiariser avec les méthodes de production du fromage et mieux connaître l'effet de la qualité du lait et de l'alimentation sur la production du fromage et la sécurité

des aliments. Les praticiens intéressés par ce créneau devraient aussi se familiariser avec les fermes de chèvres laitières et les défis uniques qu'elles représentent. Les vétérinaires peuvent développer leurs connaissances des fromages artisanaux et d'autres produits à valeur ajoutée en devenant membre de groupes de producteurs récemment établis.

Introduction

Cheese is one of the earliest known processed foods, with a history extending back at least 6000 years where tablets from the Sumerian civilization refer to it. Cheese was important to the ancient Greeks, whose deity Aristaios was considered the giver of cheese. From Greece, cheese making spread west to Rome, where techniques were refined and tastes were expanded to include smoking and adding herbs and spices. During the Middle Ages, monks discovered aging and ripening techniques for cheeses. In the early nineteenth century the first cheese factory in Europe was built in Switzerland, and by the end of the century over 750 cheese plants were operating in Europe. The first cheese factory in the US opened in 1851 in Rome, NY.¹

The artisanal cheese movement in the US began in the late 1970s and early 80s, and has enjoyed rapid growth since that time. The American Cheese Society was established in 1983, and by 2009 had over 1,200 members nationwide with over 1,300 different cheeses entered in its cheese competitions. The society defines *specialty cheese* as "a cheese of limited production, with particular attention paid to natural flavor and texture profiles"; *artisan cheese* as "a cheese produced primarily by hand, in small batches, with particular attention paid to the tradition of the cheesemaker's art, and thus using as little mechanization as possible in the production of the cheese"; and *farmstead cheese* as "defined by the American Cheese Society, the cheese must be made with milk from the farmer's own herd, or flock, on the farm where the animals are raised. Milk used in the production of farmstead cheeses may not be obtained from any outside source"².

Producers entering the farmstead and artisanal cheese fields are often highly educated, enthusiastic individuals familiar with obtaining information online. They are frequently very knowledgeable about cheesemaking and marketing processes, but have little experience with animal husbandry. Fundamentals of disease prevention,

nutrition, the milking process, and even basic concepts of housing and behavior are new to them. Fortunately these individuals are usually motivated to give their animals quality care and incorporate best management practices once they learn about them.

Veterinary Opportunities with Cheese Producers

With their broad knowledge base encompassing animal husbandry and management, nutrition, and disease epidemiology, veterinarians are in a unique position to provide a wide range of enhanced services to artisan cheese producers beyond the traditional services of developing vaccination programs and sick animal care. These services may include:

1. **Milk quality.** Increasing somatic cell count can affect both the yield and quality of finished cheese products.³ Cow milk with a somatic cell count (SCC) in excess of 100,000 has been found to result in a reduction of cheese yield due to a longer time to coagulation of the curd, resulting in increased moisture in the coagulum. Enzymes present in mastitic milk break down casein, reducing yield further.⁴ When SCC exceeds 800,000, the resulting cheese may exhibit abnormal flavor and texture. In addition to problems with a high SCC, increased bacteria counts in milk can cause off flavors and poor shelf life in cheese.

Veterinarians have many opportunities to help cheese producers monitor and improve their milk quality. Frequent bulk-tank milk cultures can help manage infection levels and identify bacteria count problems early. Bulk-tank cultures can also help cheese producers predict cheese quality and taste. Cheesemakers may use this information to grade batches of cheese. Culturing individual mastitis cases and developing protocols can help manage antibiotic usage and identify pathogens that can damage human health. Knowledge of milking systems and milking management, including cleanup evaluations, is very helpful as these small producers may not have access to routine equipment services.

2. **Nutrition.** As in all areas of dairy production, nutrition has a profound effect on animal health, production, and economics in the farmstead and artisan cheese industries. Many artisanal cheese producers have little nutritional knowledge and are too small to have an established relationship with a nutritionist. Basic services such as forage analysis and simple ration formulation can be a great help to small producers. Some specific areas where nutrition can create unique opportunities for interested veterinarians are

nutritional management for seasonal breeding and calving or kidding, nutrition while on pasture, formulating rations using home grown small grains, manipulating nutrition to maximize components and supporting the immune system to help reduce SCC.

3. **Develop protocols to reduce organisms responsible for foodborne illness.** Although foodborne illnesses related to dairy products are relatively rare, approximately 12% are due to consumption of cheeses made from raw milk.⁵ Since cheese-making concentrates organisms, it is imperative that pathogens remain out of the production process. Of particular importance are *Listeria*, *Salmonella*, *Staphylococcus aureus* and *Escherichia coli* 0157:H7.

Staph aureus intramammary infection is on every cheesemaker's watch list. Farmstead cheese producers often milk animals in older facilities using antiquated equipment, with little attention paid to the fundamentals of proper equipment function or milking hygiene. In a 2010 survey of artisan cheese producers conducted by the University of Vermont, 65% of producers surveyed used a pipeline or parlor milking system, but only two farms had automatic detaching systems. Some 35% used buckets. In this survey, 14 of 21 farms surveyed were positive for *Staph aureus*.⁶ Veterinarians have a significant opportunity to aid producers by identifying infected individuals and developing a control plan for *Staph aureus* and other mastitis pathogens.

Listeria monocytogenes, a significant pathogen that can cause animal and human disease, can also be found in healthy animals and in milk plant equipment. Roughly 2500 human cases of listeriosis are estimated to occur each year in the United States, including 500 deaths.⁷ Most cases in ruminants appear to be caused by exposure to contaminated feed. Moreover, up to 50% of fecal samples from cows with no clinical signs were found to contain the organism. Although human exposure rarely occurs from direct contact with infected animals or contaminated milk plant equipment, consumption of raw milk products and raw vegetables contaminated by infected manure or equipment may be sources of human exposure.⁹ In the 2010 UVM survey,⁴ *Listeria* was not recovered from any of over 100 milk samples tested, but the organism was found in over 49% of samples of comingled milk from commercial dairy farms in a 2010 report from the National Center for Food Safety and Technology.⁸ Control of *Listeria* is of critical

importance in the raw milk cheese industry, since pasteurization is very effective in killing the organism. Veterinarians with knowledge of listeriosis and the epidemiology of *Listeria* can help guide producers with knowledge of proper storage and fermentation of fermented forages.

4. Advise producers in the selection and care of alternative breeds and animals suited to cheese production. Opportunities exist for cheese producers to use cattle breeds, such as European breeds, not commonly found in the US. This can serve both as an opportunity to produce milk with a unique component profile for their cheese and as a marketing opportunity to distinguish their product. Some European breeds may be better able to adapt to the special challenges that seasonal production presents. Some producers require a variable, often prolonged, dry period for their animals. Modern high producing dairy animals often have a difficult time enduring this variability in good health.

Veterinarians interested in artisan cheese production should be prepared to offer services to goat dairies. Poor milk quality in goat milk has the same effects on cheese yield as in cow's milk, but milk quality indices are different for goats than for cows and veterinarians interested in goat dairies should understand these differences⁹. As on any dairy, goat milk producers can benefit from protocols written for promoting animal health and well-being as well as efficient management practices. Since goats are seasonal milk producers and demand for goat milk cheeses continues year round, veterinarians can help develop off-season cycling and breeding programs.

5. Aid producers in obtaining a certificate of humane handling. Requirements for humane certification include developing an animal health plan, protocol development, and record keeping. Standards for dairy cattle mandate that the health plan be developed in consultation with the herd veterinarian. If any herd performance parameters fall outside tolerance limits identified by the producer and the attending veterinarian, the veterinarian must be informed and management practices adjusted to try to resolve the problem¹⁰. Standards for Certified Humane may be found at their website, certifiedhumane.org.
6. Bring new ideas and innovations to the farm. Although many farmstead cheese producers are decidedly "low tech", like any dairy farmer they still will benefit from such technologies as new vaccines and therapeutics.

Involvement in Off-farm Activities

Interested veterinarians have many ways to learn about the artisan and farmstead cheese industry. Organizations such as the American Cheese Society, the Vermont Institute of Artisan Cheese, and the Vermont Cheese Council offer information, classes, and contacts. At last year's Vermont Cheesemaker's festival, over 40 cheesemakers offered tastes of more than 100 different cheeses to the hundreds of attendees. This type of festival provides an excellent opportunity to meet producers, learn about the industry, network with industry members, and market services. Teaching or participating in seminars and classes through local cheese societies will help raise awareness of veterinary services. Developing a clinic website will go a long way to help market services to these web savvy individuals.

Conclusions

The artisan and farmstead cheese industry is a vibrant and growing segment in the dairy foods industry. Veterinarians who are interested in providing services to these innovative producers have many opportunities to build personal, long lasting relationships. Rewards are many, especially when one is able to bring home and enjoy the results!

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