149 Consumer fluid milk choices: Balancing nutrition, safety, cost, and emotions. K. Bolen* and L. Timms, *Iowa State University, Ames*.

In the past few years, many questions have surfaced over numerous claims on fluid milk labels ranging from rbST- free, organic, and conventional milk. Often times these value-added or label claims come with an increased price tag per unit of milk. A recent study conducted by Penn State University and University of Missouri, in conjunction with Monsanto, looked at milk quality, nutritional value, and hormonal differences among organic, rbST-free, and conventional labeled (no rbST- free or organic claim) milk. The study encompassed 334 commercial milk samples from 48 states. Results of this study showed that rbST-free, conventional, and organic milk were compositionally similar in many measures, but slight yet significant differences were shown. Organic labeled milk had decreased levels of IGF-1 which is known as a risk-factor for cancer, especially breast cancer. Previous studies have shown slightly higher IGF-1 in milk from cows administered rbST compared to non treated controls, but no differences were shown in the fluid milk samples in this study. Organic milk has also been shown to contain increased levels of conjugated linoleic acid which has cancer-fighting properties and is found in dairy products and other animal products, but it cannot be produced by the human body. Organic milk contained higher levels of the hormones estrogen and progesterone, while conventional milk has significantly lower bacterial counts than rbST- free and organic milk. Results of this and other studies have shown few and minor differences in milk composition. Although compositional differences are present but minute, price differentials can be substantial. Prices in the study showed rbST-free and organic milk priced $1.00 and $4.00 higher per gallon, respectively. At the local HyVee in Ames, Iowa, a ½ gallon of 2% organically labeled and conventionally labeled milk were $3.69 and $1.44, respectively. People have a choice when it comes to choosing their milk and there are many factors that play into their decision such as emotions, price, nutrition, and safety, but when the milks are virtually the same is the price difference really worth it?

Key Words: rbST-free, organic, conventional milk

150 Raw milk: The controversy continues. S. Stelly*, *Louisiana State University, Baton Rouge*.

Raw milk is defined as milk that is taken straight from the cow that is not pasteurized. It has been said that drinking raw milk could prevent several types of diseases. Among these are heart diseases, kidney diseases, cancer, and lactose intolerance. The argument is that pasteurization destroys nutrients in the milk that helps prevent these diseases. More and more people are starting to believe this and in all actuality it is just not true. The nutritional value of milk and milk products is very much unaffected when pasteurized. In fact the truth is that drinking raw milk can be a great danger in your overall heath. Even though milk and dairy products are important components of a healthy diet, they can be health hazards if consumed unpasteurized because of possible contamination with pathogenic bacteria. It has been documented that numerous food borne illnesses related to unpasteurized milk consumption have occurred since 2005, including outbreaks of salmonellosis, campylobacteriosis, and *E. coli* infections. Since there are advocates of both raw milk and pasteurized milk the controversy over legalizing the sale of raw milk is growing. Understanding the science behind this controversial topic will enable consumers and lawmakers to differentiate fact from fiction when making decisions regarding the legalization of raw milk sales.

Key Words: raw milk, health risks, controversy

151 Human health benefits of bovine colostrum. P. F. Welch*, D. R. Winston, and R. E. James, *Virginia Polytechnic Institute and State University, Blacksburg*.

The dairy cow provides nature's most nearly perfect food. Many products such as cheese, yogurt, and ice cream are derived from milk. Colostrum, either fed to calves or discarded, is generally not considered for human consumption because of the potential for antibiotic residues from dry cow antibiotic therapy. However, interest has increased recently concerning supplementation of human diets with colostrum. Some companies are pursuing colostrum supplementation as another niche market for the dairy industry. Over the past several years demand for supplements derived from colostrum has grown, especially among professional athletes. Colostrum contains insulin-like growth factors I and II (IGF I and II), which have been clinically proven to help increase lean muscle mass and regulate blood sugar and cholesterol levels. Data from the Center for Nutritional Research indicates that bovine colostrum also has beneficial effects when treating gastrointestinal disorders. Colostrum supplements claim to restore the GI tract to optimal functioning while blocking action of pathogens. With all these purported health benefits, colostrum supplementation is gaining popularity with products such as Colostrum D-90, Colostroplex and Colostrum 800, available as tablets, capsules, and/or powders. It may be possible for the dairy industry to capitalize on this niche market for colostrum products and implement strategies on marketing them to athletes and other health food conscious consumers.

Key Words: colostrum, colostrum supplements

152 Importance of conventional dairy products in young adult diets. K. M. Stomack* and E. L. Karcher, *Michigan State University, East Lansing*.

Milk is nature's most perfect food and plays an important role in the diet of young children. Among all the minerals on earth, calcium is one of the most important for humans. Calcium is used by the human body for the growth of bones. This essential mineral is vital for infants as it has been found to stimulate cell growth and maturation of the digestive system (Ebringer et al., 2008). Toddlers obtain calcium more easily from milk than from their bodies and use the fat from milk as a source of energy for growth. By ensuring the body has proper calcium such diseases as osteoporosis can be avoided and proper blood clotting factors can be maintained. Due to its many functions, it is essential to maintain adequate dietary calcium through food sources such as leafy vegetables including broccoli, spinach, and cabbage, and especially dairy products. Recent societal trends towards perceived healthy eating have focused on increasing the amount of rice and soy milk in the diets of infants and children. As a result, there has been an increase in nutritional deficiencies among children given these conventional milk alternatives. The American Academy of Pediatrics has reported the occurrence of nutritional deficiencies in children 17-22 months old who have received milk alternatives (Carvalho et al., 2001). Additional risk may occur when vegan mothers choose to raise their young children with the same dietary beliefs. Dairy is an essential part of a growing child's diet as it

plays key roles in important bodily functions. Therefore, milk should be considered a staple ingredient in the diets of young children.

Key Words: calcium, children, milk

153 Risks associated with raw milk consumption. A. M. Harshbarger*, *The Pennsylvania State University, University Park*.

Milk is handled and processed in a manner that makes it a safe, quality beverage. Before reaching the consumer, it must first pass numerous quality assurance standards. However, people who choose to drink raw milk may be putting themselves at risk for exposure to pathogenic bacteria normally controlled by pasteurization. Milk that has not been pasteurized poses risks for contamination via *Salmonella*, *E. coli*, *Listeria*, and other organisms. A study by Jayarao and Henning showed 12 of 131 farms in South Dakota and Minnesota had positive bulk tank samples for *Campylobacter jejuni*. Additionally, 6% of the tanks contained *Salmonella*. Common sources of bulk tank milk contamination include manure and bedding. Udder health and proper sanitation of milking equipment are also factors. Some areas of the United States have seen an increase in the number of foodborne illnesses linked to raw milk. In Pennsylvania, the first major reported case of illness resulting from unpasteurized milk occurred in 1983. Sixty first grade students were touring a dairy farm as part of a field trip. When it was time for a traditional snack of cookies and raw milk, all but a few of the students became ill as a result of *Campylobacter jejuni*. Some consumers and dairy producers prefer raw milk, even when they understand its associated hazards. Surveys of raw milk drinkers by Rohrbach and Jayarao indicated that 34% of eastern Tennessee citizens and 42% of Pennsylvanians who drink raw milk preferred its taste and convenience. This survey also concluded that many dairy producers who drink their own bulk tank milk are not familiar with the pathogenic bacteria that may be present. Pasteurization makes food borne illnesses resulting from drinking raw milk very preventable. Strict measures have been put into effect by several states to help protect public health. In Pennsylvania, the sale of raw milk is legal only if the producer has a permit from the Pennsylvania Department of Agriculture. However, regulations are not uniform across the nation. It is important that the dairy industry develop an educational plan to inform consumers and dairy producers about the possible risks associated with drinking raw milk.

Key Words: raw milk, foodborne pathogens

154 Defending the US milk supply with a novel bulk milk transportation security system. C. N. Gravatte* and C. D. Thompson, *University of Kentucky, Lexington*.

Increasing concern exists about the safety of US food. The next terrorist attack may be within the food supply, rather than through traditional targets. Of particular concern are bulk foods consumed within days of leaving the farm, especially milk. In light of this, researchers at the University of Kentucky, in conjunction with the University of Louisville, Western Kentucky University and the Kentucky dairy industry, have developed a security system that keeps milk locked up on the truck from farm to processing plant. The traditional security system consists of small, numbered zip ties accompanied by handwritten records. This system is labor and paperwork intensive and is susceptible to human error. The new security system would provide more accountability for the driver because it documents every interaction with the tanker. The system consists of three components: a tank monitoring system (TMS) located on the milk transport tank, a handheld device (computer), and a remote data server. The TMS is probably the most important security feature of the three. It allows entrance into the tank to either collect milk from a producer or deliver milk to a processor. Working in tandem with a keypad user interface, it will document everything that occurs, including opening and closing of the tank. Then, the GPS portion of the system documents where the truck is when it is being opened or closed. This system is designed not only to be a safer alternative to the current milk transportation system but also to help the marketing agency, farmer, and truck driver to keep better records. The handheld device allows the driver to input data about each load as it is collected. They can also keep track of milk weight and temperature. This information is then sent to the remote data server via cell phone. Other users access the server over the Internet and can generate reports about the load of milk. This system not only facilitates a safer milk supply, putting consumers minds at ease, but also opens the door to safer bulk food transportation and, ultimately, a safer food supply.

Key Words: agri-terrorism, milk safety, security

155 On farm pasteurization: Finding a niche market. J. T. Price*, *Clemson University, Clemson, SC*.

As today's farmers continue to face the difficulties of increased fuel costs, feed costs, and low milk prices they are beginning to find alternative ways to turn a profit. Some farmers have begun to market their own on-farm pasteurized products locally as well as to milk coops. Until recently it has been difficult for small dairies (30-200 cows) to survive competing with larger dairies (more than 800 cows); however, the niche market of farmstead production has allowed many farms to continue operating. Farmers in this enterprise are able to produce, process, and market their products on farm. This not only allows potential for increased farm revenue and convenience to farmers, it strengthens relationships between farmers and consumers and provides an opportunity for these farmers to increase consumer awareness. This niche market is based on providing fresh, quality milk, as well as other dairy products, to consumers while eliminating the middle man and enhancing consumer relations as well as revenue. On-farm pasteurization is becoming more common due to a demand from consumers who are now caring more about where their food comes from. Statistics show that approximately 40% percent of consumers are concerned about the origin and processing of the food they consume. Even though there are many advantages to on farm processing there are also a few challenges. These obstacles that farmers would have to overcome include finding a market which consists of customers willing to buy their products, obtaining a milk processing license, finding and purchasing affordable equipment, as well as fulfilling and maintaining sanitation requirements and conditions set by the government. However, through overcoming these obstacles dairy farmers will be able to increase profit through marketing and selling their own products while simultaneously educating consumers about the dairy industry. This new specialty market provides consumers with an opportunity to purchase locally produced, fresh products as well as allowing smaller dairy farms the opportunity to survive the changing times.

Key Words: dairy, farmstead, pasteurization