a food grade enzyme, transglutaminase. Other food processing methods have used this enzyme to crosslink proteins in the presence of calcium. The enzyme has been used to produce a curd. In our study, three replicate trials with unfortified skim milk and direct set cottage cheese manufacturing were completed. Experimental vats were manufactured using 10 units of transglutaminase enzyme per gram of total protein in the skim added immediately after the glucono delta lactone acidogen. Three washes of the cooked curd were completed. Samples of the skim milk, whey, wash waters, and curd were collected for a mass balance. All trials resulted in more protein recovery in the experimental cheese compared with the control cheese. The magnitude of the increased recovery was not significant. All experimental vats contained less protein in the whey than the corresponding control; however the magnitude of decreased protein was not significant.

Key Words: Leptin, Dairy Cattle

960 Analysis of financial measures comparing 3 management styles. W. T. Wenc* and G. Hadley, University of Wisconsin, River Falls.

The objective of this research was to determine if management style influenced profitability. The management options compared included: Management Intensive Rotational Grazing (MIRG), a stored feed group, and a mixed feeding group. Survey results were used to define management style. MIRG was defined as a producer who used pasture as the major forage source of feed. The stored feed group was defined as farms that had no pasture access for animals. Finally the mixed feeding group was defined as farms that provide minimal grass for grazing, but pastures are not managed intensively. The number of farms whose survey results indicated the different management styles were: MIRG-30 farms, stored feed-226 farms, and mixed feeding-26 farms. There were nine different financial ratios used in this research; they dealt with issues of: liquidity, solvency, profitability, repayment capacity, and financial efficiency. Dupont analysis was performed on the financial ratio measures calculated from the Agricultural Financial Advisor (AgFA) database. This database contains the financial information of 600 Wisconsin dairy farms. The results were analyzed using a statistics program to test for statistical significance between results. Based on the results, MIRG is at least a competitive option for dairy producers.

Key Words: Financial, Grazing

962 Leptin: What is its role in the dairy cow? D. C. Barbour* and E. H. Jaster, California Polytechnic State University, San Luis Obispo.

Dairy cows in early lactation experience a negative energy balance that often pre-disposes them to metabolic disorders. Ketosis, periparturient paresis, and displaced abomasum are examples of these disorders that arise from insufficient energy levels at parturition and freshening. Negative energy balance occurs in the dairy cow because the amount of energy expended for body maintenance and production exceeds the amount of energy available from dietary sources. Leptin is a peptide hormone produced by white adipose tissue that acts on the hypothalamus as its primary target organ. Leptin has been demonstrated to be closely associated with metabolic traits that maintain homeostasis despite negative energy balances in early lactation. Leptin is also thought to regulate processes that are highly dependent on positive energy supply. Some of these are developmental processes which include the onset of puberty, ovarian function, and formation of mammary secretory tissue, as well as other processes including responses to stress and general reproductive and immune functions. Research has determined that leptin serves as a mediator of nutrition, and an indicator of nutritional status and body conditioning in dairy cattle. Recent discoveries in nutritional biochemistry and DNA technology indicate that leptin has been shown to contribute to fat deposition, nutritional status, reproductive function, and immune response in dairy cattle.

Key Words: Leptin, Dairy Cattle

963 Managing an ovulation synchronization program with PCDART. J. C. Roberts*, Louisiana State University, Baton Rouge.

Ovulation synchronization is the use of exogenous hormones to induce the onset of ovulation in dairy cattle. Ovulation synchronization is a common practice on many US dairy farms. It can increase profitability on a dairy farm by reducing the average days to first breeding and consequently the average days open per cow on the farm. It can also improve the labor efficiency on the farm by reducing the need for heat detection. Ovulation synchronization requires that specific hormonal events be given to individual animals at specific time intervals. One disadvantage of using ovulation synchronization is the difficulty in coordinating several events associated with the protocol on a large number of animals in a dairy herd when different animals require different events on a particular day. Another disadvantage of using ovulation synchronization is the need to keep accurate records on which events were given to which animals during a given time frame. There would be no way of knowing which event an animal should receive at what time without this information. This would quickly render the program ineffective. PCDART is a computerized record keeping system for use in dairy herds. PCDART is used to manage all of the information recorded on individual animals such as milk production, breeding, calving, etc. PCDART can also be used to manage ovulation synchronization programs in a dairy herd. Dairy farmers can use default ovulation synchronization protocols that are built into the program or they can design their own protocols. After setting up an ovulation synchronization protocol the farmer wants to use, they then tell PCDART which cows are going to be synchronized. PCDART will then create daily or weekly reports telling the farmer which cows receive which hormonal treatments on a given day. This process greatly reduces the amount of time the farmer has to spend de-
In a world market where the BTSCC of most herds is required to be below 400,000, most major dairy production countries outside the U.S. average below 250,000. With a national average of 350,000 in 2002, the U.S. has increased its risk of losing share in this growing global market. Low somatic cell scores are important in every link of dairy product production, and has the potential to save the U.S. industry over 1 billion dollars every year. Low SCC is beneficial to the cow because it creates better overall health. For dairy producers, reducing mastitis levels will indirectly increase their milk price through quality premiums and create a higher level of productivity. Dairy product processors profit through higher product quality and increased yields during production. The marketing industry wins by being able to sell a product proven to have a longer shelf life. And the consumer wins with a high quality product that they can always trust to be wholesome, nutritious, and good tasting. Lowering SCC just makes sense for everyone! So how should producers go about lowering the SCC of their herd? The process is not as daunting as it first appears. First, producers need to understand the problem by culturing cows and developing a plan of attack against high SCC. Then, managers need to evaluate protocols, especially protocols for milking procedures as well as stall and bedding management. Cow care is also important because animals need a healthy and stress-free environment to be highly productive. Last, but definitely not least, a producer must change his mindset about milking cows in order to lower SCC. This involves setting goals for SCC, developing effective protocols for management, and training everyone who milks to follow the process without fail. The U.S. dairy industry has a clear need to lower its SCC in order to compete on a world marketplace and remain a viable industry in the domestic sector. The time to do something about it is now.

967 The battle against high somatic cell counts: worth fighting – worth winning. A. R. Hazel* and J. K. Neau, University of Minnesota, St. Paul.

Factors affecting fertility rates in embryo transfers. J. Hockney*, North Carolina State University, Raleigh.


Colostrum intake is essential for the development of passive immunity in the neonatal bovine because placental structure does not allow in utero transfer of antibodies from dam to fetus. For this reason calves must ingest an adequate amount of colostrum containing high levels of antibodies within hours after birth. Poor colostrum management may cause calves to consume pathogenic organisms such as Mycoplasma or Mycobacterium paratuberculosis. A large percentage of dairy producers pool colostrum from fresh cows, increasing this risk of disease spread by creating a mix of uncertain antibody contents and pathogenic bacteria. Pasteurization may present an alternative to calf raisers who pool colostrum when attempting to reduce disease transmission from dam to calf by killing pathogenic bacteria through heating colostrum to high temperatures. While pasteurization may rid colostrum of disease causing organisms, it may also reduce the concentration of Immunoglobulin G, the main antibody whose absorption leads to passive immunity in calves. Godden (2003) reported IgG concentrations were reduced by 58.5% in 95 L batches and 23.6% in 57 L batches of pasteurized colostrum.

Key Words: Embryo Transfer, Colostrum, Pasteurization

965 Got Milk Insurance? L. B. Core*, University of Kentucky, Lexington.

Dairy producers nationwide continually struggle with the volatility of the milk market. From the record high prices of 1998 and 1999, to the devastating low prices of 2000, and the rebound of 2001, producers constantly have to strike a balance between enjoying the highs and budgeting for the lows in milk prices. However, another option is available to producers. Insuring milk prices with forward, futures, and options contracts rather than accepting the cash market is a viable option for many dairy producers. These three alternatives do not guarantee maximum profit, but instead allow producers to budget more effectively than feeding sub-therapeutic levels of antibiotics such as ionophores, which are not used in humans, feeding sub-therapeutic levels of antibiotics such as ionophores, which are not used in humans, feeding sub-therapeutic levels of antibiotics such as ionophores, which are not used in humans, feeding sub-therapeutic levels of antibiotics such as ionophores, which are not used in humans, feeding sub-therapeutic levels of antibiotics such as ionophores, which are not used in humans.

Key Words: Milk Prices, Futures, Profitability
can prevent diseases and infections, such as coccidiosis, that would normally be treated with stronger antibiotics commonly used in human treatment. Therefore, ionophores may reduce the threat of antibiotic resistance. Ionophores are approved for use in young stock, and are currently under review for approved use in lactating cattle.

**Key Words:** Ionophores

**970 Centralized pregnancy detection: A new option for fertility evaluation.** A. Barten* and L. Fox, Washington State University, Pullman.

Pregnancy Specific Protein B (PSPB) can be used as a centralized pregnancy detection aid. During the third week after conception, binucleate giant cells, in the ruminant placenta produce a glycoprotein called Pregnancy Specific Protein B. This protein can be detected with an enzyme-linked immunosorbent assay (ELISA) at day 30 of gestation in multiparous cows and at day 28 of gestation in primiparous heifers. The test is 92.5% accurate for identifying pregnant cows and over 99% accurate for identifying nonpregnant cows. A blood sample is collected from each cow and delivered to a centralized laboratory, (usually at a veterinary clinic), where the test is completed. The laboratory then prepares a report for the herd manager or veterinarian. Results are available electronically to the herd manager and/or veterinarian within 27 hours after the sample was taken. The centralized pregnancy evaluation concept provides the following advantages over traditional on-site palpation for pregnancy: 1) A high degree of quality control for assay accuracy as opposed to potentially low quality control for on-farm testing; 2) Data from multiple herds can be easily summarized; 3) Increased ability of the veterinarian and management team to compare herds with regard to application of successful programs; 4) More quality time available for the veterinarian and management team to evaluate and make improvements; 5) Reduced probability of embryonic death due to palpation and erroneous hormone use and 6) Elimination of error prone steps with data recording and transfer. PSPB can be used as a tool to improve reproductive efficiency by minimizing days open, reducing the calving interval and maintaining adequate days in milk. This approach is currently in use in the states of Washington and Idaho and will provide new options for evaluating pregnancy status in dairy cattle.

**Key Words:** Pregnancy Specific Protein B, Testing

**971 An industry approach to increasing the consumption of dairy products.** B. Lyons*, Louisiana State University, Baton Rouge.

According to USDA, consumption of soft drinks has steadily increased over the past 40 years while milk consumption has decreased. The incidence of bone fractures has increased by 42%, especially among children and young adults, over the past 30 years. Researchers are concerned that many children and teenagers are not getting proper amounts of calcium in their diets. In time, the trend of less milk and more soda could lead to increased occurrences of osteoporosis. These data show that consumption of dairy foods is important to our nutritional well-being. The Food Guide Pyramid recommends consumption of 2-3 servings of dairy products/d. Milk and dairy products offer a range of well-known health benefits, the best known being calcium for proper bone health. In 1984, the Dairy Check-Off Program was implemented to provide funding for marketing, research, and educational programs. Through this program, the industry is working to increase dairy product demand and strengthen dairys image. Since the program began, dairy consumption per capita has increased 11%. Researchers across the country are finding new ways to make dairy products more appealing to young consumers through checkoff funds. Education is important to keep the importance of nutrition at the top of everyones priorities and with the help of the Dairy checkoff the dairy industry is able to offer nutritional information to consumers of all ages. The checkoff funds 3-A-Day of Dairy, a nutrition-based marketing and education campaign to promote healthy diets and increase demand for dairy products. The Got Milk? ads are still a big hit with consumers, and checkoff funds are continually used to feature new celebrities for promotion. Fast food restaurants are beginning to offer milk with childrens meals, and this is receiving positive responses from parents. With the consumption of dairy products continuing to decline, the dairy industry must persist in efforts to promote their products. The research, marketing, and educational programs funded by the checkoff are steps in the right direction for increasing consumer awareness of the importance of dairy products for health and well-being.

**Key Words:** Dairy Products, Consumption, Industry Programs

**972 Probiotics in dairy products- Beyond nutrition.** S. Phetsomphou*, North Carolina A&T State University, Raleigh.

Microbial cultures have been used for thousands of years in food and food fermentations. Since the past century, there is strong evidence that the microbial cultures have the ability to prevent and cure a variety of human diseases. Probiotics are one group of these microbial cultures that are becoming increasingly popular in the United States and Europe. Although there are many different types of probiotics, the most common are Lactobacillus bulgaricus, L. acidophilus, L. reuteri and bifidobacteria. Dairy products such as fluid milk and yogurt are the popular food products that contain probiotic cultures. Probiotics are defined as viable microbial cultures that have positive impact on human health. A number of studies have found probiotic consumption to be useful in the treatment of many types of diarrhoea, including antibiotic-associated diarrhea in adults and young children. Several studies have shown that certain strains of probiotics, such as L. bulgaricus and bifidobacteria, can alleviate symptoms of lactose intolerance by providing bacterial lactase to the intestine and stomach. Probiotic consumption may also be a means for primary prevention of allergy in susceptible individuals. Studies have shown that regular consumption of probiotic could have a positive impact on cancer prevention. Animal and in vitro studies indicated that probiotic bacteria may reduce colon cancer risk by reducing the incidence and number of tumors. Functional foods including dairy food products have been known as a mean for disease prevention and the quest for optimal health at all ages. Therefore, probiotics cultures could play a big role in the human diet beyond nutritional aspects.

**Key Words:** Probiotics, Bifidobacteria, Dairy Products

**973 On-farm milk processing.** A. R Nelkie*, North Carolina State University, Raleigh.

On-farm milk processing plants are becoming increasingly popular as an enterprise option for dairy producers as they try to add value to their commodity of raw fluid milk. Lemajur Dairy Farm, a 100% registered, 100 cow milking herd located near West Branch, MI is being used as the experimental farm in this research model to determine if an on-farm milk processing plant is profitable. The cost of the equipment, the construction of the plant, the increased labor in the form of new employees, and the cost of operating it will be calculated. Figurative prices fabricated from local grocery stores and current on-farm processing plant are used to calculate the profit. Last year's gross income for the farm sale of raw fluid milk was around $300,000. To build an on-farm processing plant, the income will have to cover the $300,000 plus enough to pay for employees, loans and the cost of extra utilities needed to operate the machinery. The farm is capable of producing approximately 5000 gallons of milk each week. An estimated cost for the building and purchasing of equipment is around $700,000 upwards to $800,000. The endeavor has the ability to produce $750,000 per year, making this an equitable project if family help can be obtained to work the plant thus keeping start up costs down.

**Key Words:** Dairy Foods Undergraduate Paper Presentations

**974 Farmstead cheese production.** K. E. Harwick*, Pennsylvania State University, University Park.

The farmer’s share of the consumer food dollar has dropped from 46% in 1913 to 20% in 2000. A natural result has been to increase farm size, but not all producers can or want to expand. Alternatively some dairy producers have opted to produce and market value-added products such as cheese. These products produce a higher return, can open new markets, and provide brand recognition while adding variety to a farms normal operation. Consumers are willing to pay more for a value-added product, allowing for a higher quality of farm life. When deciding