

ADSA Centennial Posters

C1 California Dairy Research Foundation: Creating Opportunities, Adding Value to Dairy. J. O'Donnell*, *California Dairy Research Foundation, Davis, CA.*

While only 18-years-old, the California Dairy Research Foundation (CDRF), like the American Dairy Science Association (ADSA), is committed to the advancement and stimulation of dairy knowledge and discovery. Executive director, Joseph O'Donnell, has been a member of the ADSA since 1983 and served as vice president, president and past president of the board (2002-2005), as well as in several committee leadership positions. The CDRF was created in 1988 as a not-for-profit research corporation to promote research and development activities benefiting California's producers, processors and consumers. With its creation, the CDRF became the first and only regional, industry-operated organization managing dairy foods research activities. Since its inception, the CDRF has managed more than 500 dairy research projects at such institutions as University of California, Davis, California Polytechnic State University (San Luis Obispo), North Carolina State University and Fresno State University. Research highlights include product technology/development (edible films and coatings from WPC, Dairy Ingredients Applications Lab, flavor lexicon for milk powders, butter and whey); dairy product nutrition research (milkfat, probiotics and prebiotics, milk composition, milk genomics); dairy confidence (California Dairy Quality Assurance Program, Dairy Food Safety Lab, On-farm BTM, J-5 and Salmonella vaccines); and education (short courses, workshops, symposia, educational Web sites).

C2 California Polytechnic State University, San Luis Obispo "Tradition Never Graduates". N. Borges*, E. Jaster, and W. Gillis, *California Polytechnic State University, San Luis Obispo.*

The California Polytechnic State University, San Luis Obispo was founded in 1901 by journalist Myron Angel, the driving force behind California Governor Gage. By 1903 Cal Poly had five Ayrshire and one shorthorn, two hundred and eighty acres of land, a dorm and three faculty members. Dairy Science has been part of the curriculum since the school first opened. In 1903 the first Cal Poly dairy facility was built with concrete floors, milk room, feed room and a living quarter. The first creamery was completed in 1908. Today the current Dairy Products Technology Center, combined with the Dairy Cattle Instructional Center, is one of the most modern dairy facilities. Over the past century Cal Poly has been well represented by numerous students who have competed in various judging competitions and attending the annual ADSA conferences. The Los Lecheros Dairy Club is the largest campus club in the College of Agriculture, and members agree that 'Tradition Never Graduates.'

C3 Dairy Science at Cornell University -- A Century of Excellence. T. R. Overton* and A. W. Bell, *Cornell University, Ithaca, NY.*

Focused efforts in Dairy Science at Cornell University are almost as old as Cornell itself. Professor I. P. Roberts established the Holstein dairy herd at Cornell in the 1870s and began to conduct early experiments

on silage quality and the effects of diet on milk composition. Before the turn of the century, extension efforts to join art and science in dairy husbandry already were evident. The principle of research-driven extension that has been a core value of our department throughout its history derives from these early days. Professor H. H. Wing was named the first head of the Department of Animal Husbandry in 1903. Throughout the first part of the 20th century, research and extension efforts focused on fundamental aspects of milk synthesis and secretion, machine milking, and development of feeding standards. Of particular note was the role of Cornell scientists in the development and field application of artificial insemination in New York. During the second part of the 20th century, Cornell scientists had pivotal roles in the advancement of our knowledge of the physiology and biochemistry of milk secretion, application of statistical methods to dramatically hasten genetic improvement of dairy cattle, and development and application of detergent methods for forage analysis that resulted in changes in ration formulation systems worldwide. A focus of the latter part of the 20th century was fundamental aspects of metabolic regulation and nutrient utilization, including the leading role in the development and subsequent application of recombinantly-derived bovine somatotropin for use in the dairy industry. In addition, the development and application of the Cornell Net Carbohydrate and Protein system and derivative programs has influenced ration formulation for dairy cattle worldwide. The Dairy Herd Management Fellows program has been the leading dairy undergraduate program in the U.S. for the past 20 years. Cornell has hosted five ADSA annual meetings and has amassed 44 winners of major ADSA awards. In addition, three faculty members (G. W. Salisbury, C. R. Henderson, and D. E. Bauman) have been elected to the National Academy of Sciences based primarily upon their Cornell work.

C4 Agricultural Economists—A Century of Commitment to the Dairy Industry at Cornell University. M. W. Stephenson*, *Cornell University, Ithaca, NY.*

Agricultural economists at Cornell University have a long and proud history of work in the dairy industry. The building that houses the department is named for George Warren, a pioneer in area of farm management. 2006 marks the 50th consecutive year that the New York Dairy Farm Business Summary has been conducted. This summary provides participants with an individual farm report summarizing the production and financial progress of the firm. Cornell economists have also been instrumental in the formation and support of dairy cooperatives. The Dairymen's League (now Dairylea) was formed in 1907. Ten years later, the League had 13,000 members and held the first successful milk strike in the country. By 1922 Dairymen's League Cooperative Association had 62,000 members and was effectively bargaining with large milk dealers associations. Cornell economists were instrumental as the country struggled toward national policies that would help stabilize milk prices and mediate the terms of trade for milk. Leland Spencer was among the first agricultural economists specializing in dairy markets and policy. From that legacy, The Cornell Program on Dairy Markets and Policy was formed in 1988. This group hosts dairy economists from around the country and conducts applied research and outreach in the field. In more recent years, Cornell has had economists working in the area of commodity research and promotion. Milk check-off dollars to fund expansion of dairy demand is somewhat novel. These dollars do not promote any specific brand

of dairy product, but rather the global benefits of dairy product consumption. Understanding where producer dollars are best spent for effective advertising, new product research and health claims, is an important contribution to the dairy industry.

C5 Over 100 Years of Milk and Dairy Foods Research by the United States Department of Agriculture–Agricultural Research Service. D. L. Van Hekken*, *Dairy Processing and Products Research Unit, USDA, ARS, ERRC, Wyndmoor, PA.*

Over the past 100 years, the United States Department of Agriculture (USDA) has performed research to benefit the public good and the milk and dairy food industries. With the creation of the Dairy Division of the Bureau of Animal Industry in 1895, USDA began conducting research on understanding and improving the quality and production of milk, butter, and cheese. As the research programs grew in scope, the division became the Bureau of Dairy Industry in 1924. In 1940, milk research was moved to the newly opened Eastern Regional Research Center (ERRC), Wyndmoor, PA while the products research remained in Washington, DC. In 1955, all dairy research programs were transferred to the newly created Agricultural Research Service (ARS). Research was conducted at the Wyndmoor, PA and Washington, DC sites until 1974, when all milk and dairy products research was consolidated at ERRC. USDA chemists, engineers, food scientists, microbiologists, and molecular biologists have published over 1,800 scientific papers, proceedings, book chapters, and patents on all aspects of milk and dairy products. Their basic and applied research has pioneered the development of much of the scientific instrumentation, analytical methodologies, and processing technologies that are still used in dairy research and by the dairy industries today. USDA scientists were charter members of American Dairy Science Association (ADSA) and continue their involvement as members, symposia organizers, elected officers, and board members. They continue to publish extensively in the *Journal of Dairy Science* and have been the recipients of several ADSA awards. Today, the Dairy Processing & Products Research Unit (DPPRU), with its mission to apply knowledge of the chemistry, biochemistry, and microbiology of milk to the development of new uses to increase its utilization, nutritional value, markets and assure its safety and biosecurity, continues to conduct basic and applied research on milk and milk products. While the research emphasis has shifted from improving the quality and production of bulk milk products to the new frontier of understanding the molecular basis for their properties, the main goal of the DPPRU is to conduct research that benefits the public good as it was over 100 years ago.

C6 The products, the people and the services of Diamond V Mills make the dairy industry more productive. I. Yoon*, M. Scott, and B. Kimbro, *Diamond V Mills, Cedar Rapids, IA.*

Since our foundation in 1943, Diamond V Mills has been the world's leading manufacturer and marketer of yeast culture products. The all-natural yeast culture, produced from a proprietary fermentation technology and backed by years of research, supports the production and health of dairy animals. Diamond V has a long history of research and service that has benefited the dairy industry. Diamond V took leadership in pioneering research to investigate yeast culture effects on the rumen and whole body metabolism and its impact on dairy

production. Many studies have shown the importance of a stable ruminal fermentation on energy metabolism and productivity in dairy cattle. Others have shown that ruminal bacteria have unique nutritional requirements and their growth may be improved by oral administration of specific products, such as yeast culture, that stimulate microbial growth. Results of these studies have allowed the industry to embrace yeast culture as a standard management practice. In addition to in-house research, Diamond V recognizes the importance of collaborative research and has worked with more than two dozen dairy research institutions. Sponsoring graduate programs and university foundations, helping dairy producers recovering from natural disasters, and serving as board members of local governing industry organizations are all important parts of Diamond V's public service. Diamond V's technical staff has been instrumental in providing up-to-date information to dairy advisors and producers. Diamond V has been very active in supporting national and regional dairy science meetings, symposia, and conferences. Since 1990, Diamond V has maintained corporate sustaining membership with ADSA and sponsoring annual meetings as a platinum or gold sponsor. Quality products, people, and services and its business ethic make Diamond V a trusted name in dairy industry and the world's leading manufacturer and marketer of yeast culture products.

C7 100 Years of Dairy Science at Kansas State University. K. A. Schmidt*, M. J. Brouk, T. G. Rozell, J. E. Shirley, J. F. Smith, and J. S. Stevenson, *Kansas State University, Manhattan.*

Kansas State Agricultural College was established in 1863. As early as 1883 dairy products such as butter and cheese were produced at the college and sold to the community. In 1899, the Dairy School was established with departments in butter-making, cheese-making, and dairy farming. The 'new dairy barn' followed in 1903. In 1911, the dairy department offered educational opportunities, such as a 10-wk course in dairy manufacturing, short courses for testing dairy products, 2-yr short course on dairy farming, and a 4-yr degree in dairying. In 1913, the Dairy Commissioner authorized the College to inspect the state's 250 creameries, dairies, ice cream factories, and cream-buying stations. In the 1920's the Dairy department advised the 12 state institutional dairy herds, supervised the registry records for dairy cattle breeders as well as planned and conducted experiments on the 4 dairy breeds. In 1933, a new dairy barn was opened northwest of campus and in 1940, dairy manufacturing was added as a curriculum. In 1950's the Kansas Artificial Breeding Service Unit was established to facilitate the use of artificial insemination. The Dairy Husbandry Department was renamed the Dairy Science Department in 1961 and moved into a new building in 1964 to house the dairy science faculty and a dairy sales counter for retail purchase of dairy foods. In 1977, Dairy Science, Poultry Science, and Animal Husbandry merged into the one department– the Department of Animal Sciences and Industry. Over the years, faculty, staff, and students have addressed current issues and concerns of the state and beyond by researching a variety of topics such as development of 'Ambrosia' a buttermilk-ice cream mix, comparison of hand vs. machine-milking, diet formulations to maximize milk components and yields, milk off-flavor and odors control, silage processing and preservation, reproductive management, heat abatement, and cow comfort.

C8 The Dairy Science Club at Louisiana State University Celebrates the 100th Anniversary of ADSA. C. C. Williams, B. Lyons, M. Konzelman*, A. Greenbaum, K. McClelland, and P. McGrew, *Louisiana State University, Baton Rouge.*

The LSU Dairy Science Club was first known in 1923 as the “Cream and Cow Club”, and it was formed to provide recreation and to sponsor educational activities. It was ten years later that the formal charter was presented, and the members were part of the Louisiana State University Dairy Science Club. In 1956 the Club became affiliated with the American Dairy Science Association. It readily established its reputation as an outstanding club by winning third place in its first year of affiliation. Since 1947 the Dairy Science Club has chosen a Dairyman of the Year, and in 1956 it began awarding an individual Honorary Lifetime Membership in the Club. In 1999, the club changed its name to ‘The Dairy Science Club at LSU’ due to the trademark issues with the LSU logo. The leadership qualities of the Dairy Science Club at LSU are exemplified in their past and current achievements in the Student Affiliate Division of ADSA. Five students have been National ADSA-SAD Presidents, five have been First Vice-Presidents, two Second Vice-Presidents, five Third Vice-Presidents, five Secretary-Treasurers, and five Officers at Large. Six students from the club have been selected as the recipient of the Outstanding Student Award. The club was First Place Chapter in 1960, 1966, 1968, 1969, and 1976. Four club advisors have served as National ADSA-SAD advisors and received the Outstanding SAD advisor award. Over the years, the Dairy Science Club at LSU has continued to grow and prosper. They are active at the local, regional, and national levels of ADSA. Whether the activities are of a promotional, fund-raising, educational, or even a social nature, the Dairy Science Club at LSU has set many precedents which other clubs have followed. While dairying as a science and an industry will take part in the next 100 years of development, members of the Dairy Science Club at LSU will be looking ahead for many years of accomplishments.

C9 100 Years of service to the dairy industry. B. Jenny*, K. Aryana, G. Hay, and C. Williams, *Louisiana State University Agricultural Center, Baton Rouge.*

The Dairy Science Department has a long history of research, teaching and public service programs that have benefited the dairy industry of Louisiana and the nation. Dairy programs were first initiated on what was then the campus of Louisiana State University in 1904 when the state legislature appropriated \$5000 for the establishment of a dairy herd, dairy barns and creamery. The department expanded out of the Animal Industries Department. In 1921 the Department of Dairying was formed with responsibility for teaching and operation of the dairy farm and creamery. In 1929 the Dairy Research Department was formed as a part of the agricultural experiment station and had responsibility for research in dairying. These two departments were joined in 1948 as the Dairy Science Department. Dr. J. B. Frye, Jr. was employed as the head of the newly created department and served in that capacity until 1984. Some of the original faculty included Dr. L. L. Rusoff, Cecil Branton, A. J. Gelpi, and T. E. Patrick. Dr. L. L. Rusoff was recognized for his pioneering research in dairy cattle nutrition and was the 1965 recipient of the prestigious Borden Award. Funds to establish the Dairy Improvement Center in the department were made available in 1947. Louisiana Animal Breeders Cooperative, a founding cooperative of Genex Cooperative, Inc., began in this facility. Genex continues to cooperatively operate a custom collection facility at this location.

The Dairy Improvement Center also houses the DHIA laboratory which continues to serve member herds in Louisiana, Mississippi, and Alabama. Graduates of the Dairy Science Department have gone on to serve the dairy industry in both academic and related industry positions. The Dairy Science Department remained as an independent department with programs in dairy production and dairy foods technology until it was merged into the Department of Animal Sciences on July 1, 2006.

C10 100+ Years of Dairy Manufacturing at MAC / MSC / MSU. J. Partridge*, Z. Ustunol, and E. Ryser, *Michigan State University, East Lansing.*

The institution known today as Michigan State University has been in the business of education, research and extension in the field of dairy manufacturing for well over the one hundred years of the American Dairy Science Association. Beginning with a modest milk-processing laboratory in the basement of Agricultural Laboratory (Cook Hall), the program has grown through three building programs and the extensive renovation of the current facilities. One of the strengths of the dairy manufacturing programs at MSU has been the commitment of the faculty, administration and state government to maintain facilities that were representative of the dairy industry. Some of the great educators and researchers of the last century have used these facilities to advance dairy manufacturing and dairy foods. People like G. M. Trout and L. G. Harmon, who not only influenced students at MSU, but also the country and the world through ADSA service as Presidents in 1950 and 1976, respectively. Dr. Trout’s ground breaking research on the homogenization of milk and the subsequent publication of ‘Homogenized Milk’ helped lead to the almost ubiquitous adoption of the technology. J. Robert ‘Bob’ Brunner (ADSA Fellow) was one of the great examples of basic scientist combined with applied scientist. His work with milk proteins and their nomenclature provided a training ground for many of the top protein scientists over the last forty years. Transfer of knowledge and skills to the industry and general populace has been at the center of the land grant philosophy that founded the Agricultural College of Michigan in 1855. A. L. Rippen modeled these Extension ideals and was recognized with the DeLaval Dairy Extension Award in 1972. The faculties of MSU have also shared their wisdom through the publication of texts that have been recognized as classics in the field of dairy foods. The wide variety of ADSA awards for teaching, research, and extension excellence demonstrates the balance of disciplines at MSU that has and continues to be a hallmark of the institution.

C11 NADC: Supporting animal health for 45 years. J. Goff*, R. Horst, T. Sutton, B. Nonnecke, and M. Kehrli, *National Animal Disease Center, Ames, IA.*

Since its beginning in 1961, the National Animal Disease Center (NADC) has been a leader in providing animal health solutions to dairy, livestock, and poultry producers. The focus of the Center is to conduct basic and applied research on the diseases of livestock and poultry that are of major economic importance to U.S. agriculture, and to apply the results to animal disease prevention and control programs. The NADC has strong research programs and capabilities in dairy, beef, swine, sheep, and turkey health research, genomics, wildlife reservoirs

and gnotobiotics. Recent accomplishments include: developed a fecal contamination detector for rapid detection of manure contamination on carcasses; developed rapid assays to detect *E. coli* O157:H7, multidrug resistant *Salmonella typhimurium* and *Yersinia enterocolitica* in livestock; demonstrated that feeding vitamin E to turkeys reduces shedding of *Salmonella* and the chance for food borne illness; demonstrated that beef quality can be improved through feeding high levels of vitamin D; developed an oral vaccine for shipping fever; assisted in the development of the RB51 vaccine for Brucellosis; collaborated with the University of Minnesota to sequence the chromosomes of the microbes that cause Johne's disease and bovine brucellosis; discovered the endocrine connection between dietary potassium and milk fever which led to development of anion supplements to reduce low blood calcium and milk fever in dairy cattle by up to 50%; described immune suppression in cows around the time of calving and the role of metabolic diseases such as milk fever and ketosis on the immune system and demonstrating a role for immune suppression in mastitis and retained placenta of dairy cattle; discovered and developed a test for bovine leukocyte adhesion deficiency (BLAD); developed a 'next generation' vaccine against the porcine reproductive and respiratory syndrome virus (PRRS). The NADC is in the process of constructing new facilities in conjunction with USDA's chief diagnostic facility, the National Veterinary Services Laboratories, and their regulatory center, the Center for Veterinary Biologics. Collectively, these three entities make up the National Centers for Animal Health.

C12 North Carolina State University Dairy Science Club History. A. Nelkie*, *North Carolina State University, Raleigh.*

Organization for the first Dairy Science Club at North Carolina State University began in 2002. It was spear headed by Dr. Mitch Hockett and student, Abigail Nelkie. They saw a need for an active Dairy club to allow NC State to participate in the collegiate dairy activities, such as Dairy judging, SAD-ADSA, and NIADC. The club officially began in 2003, with Abigail Nelkie elected as the founding president and Drs. Mitch Hockett and Kas Ingawa as advisors. The club quickly found its spot at the school and in the North Carolina dairy industry, organizing county fair milk booths, working at the NC Youth State Fair Dairy show, and Agriculture Awareness Week. In its first year of existence the club began attending SAD-ADSA southern region events with the guidance of Dr. Kas Ingawa. Since the clubs inception membership has grown to 18 members. This year the club elected its fourth president, Jennifer Young and now has a third advisor, Dr. Steve Washburn. Jason Wright and Jesse Ledbetter were the second and third club presidents respectively. Even though NC State's Dairy Science Club is new, the University has had a long tradition of participation in dairy the dairy industry and collegiate competitions. Prior to 2003, students at NC State could join the Animal Science Club to participate in Dairy activities such as showing cattle at the NC State Fair, the milking booth, or Farm Animal Days. NC State has had Dairy Judging teams since 1951 with brief interludes between 1977 to 1987 and 1993 to 2005 when there was no judging team at NC State. The Dairy Judging team was highly successful at NC State under the guidance of Coach Dr. Ray Murley. In 1958, the team finished 6th nationally. Prior to being called the Animal Science Club, the club was called the Animal Industry club aka AI club. The AI club was the first club to serve ice cream at the NC State Fair. The Food Science Club at NC State now hosts this activity. The importance of the Dairy to the University was recently demonstrated by the former Dairy Judging participants whom started an endowment fund to ensure that NC State

would have money for a Dairy judging team to travel to competitions. Prior to the 1950's old pictures found in the department show that the college was active in educating the youth on fitting and showing cattle. NC State is the birthplace of the Dairy Records Management Systems, which was started by Dr. Marvin Senger. Polk hall was the original training spot for DHI technicians. DRMS has since moved off campus but they still call Raleigh home.

C13 Contributions to the Dairy Industry by the Food Science Department at North Carolina State University. H. E. Swaisgood and T. R. Klaenhammer*, *North Carolina State University, Raleigh.*

Faculty in the department, formed in 1961, have worked across a number of areas in dairy science and contributed both fundamental and practical knowledge in these fields. Research areas have included: the development of ultra-high temperature processing and aseptic packaging technology; characterization of the enzymes and proteins of milk; identification of flavor compounds; characterization of sub-lethal damage and repair of dairy microorganisms; discovery of natural bacteriophage defense mechanisms of starter cultures; enhancing whey protein functionality; development of a cheese flavor lexicon; development of a non-acid (Sweet) acidophilus milk; and elucidation of the *Lactobacillus acidophilus* genome. The faculty of N.C. State University has received numerous association awards for their research and teaching and has also served in many leadership positions within ADSA, including three as president, and four as Board members.

C14 100 Years of Dairy Science at The Ohio State University. D. L. Palmquist*, J. L. Firkins, M. L. Eastridge, and H. R. Conrad, *Ohio State University Department of Animal Sciences, Columbus.*

From 1892 until merged in 1982 teaching and extension activities of dairy science were located at The Ohio State University in Columbus, whereas research was at the Experiment Station (now OARDC) in Wooster. Oscar Erf, first dairy professor (1907) at OSU, used the Babcock test to relate OSU teaching to dairy farmers. Dairy research was initiated in 1910 (butter quality) by A.E. Perkins. Nutrition and milk quality have been strengths of the department; mineral and protein nutrition studies were begun by E.B. Forbes (1907) and Perkins (1913). These, with vitamin nutrition and rumen digestion, were continued (1926-present) by W.E. Krauss, T.S. Sutton, W.D. Pouden, J.W. Hibbs, H.R. Conrad, and W.P. Weiss. K.L. Smith, Conrad, Weiss and J.S. Hogan did landmark research relating vitamin E, selenium and environmental mastitis. Weiss, Conrad and N. St-Pierre made important contributions to forage evaluation by quantifying the surface effect of lignin on cell wall digestion, and developed equations to estimate energy value of feeds from laboratory analyses. Rumen kinetic studies of forages, 15N and role of protozoa in rumen metabolism were introduced by J.L. Firkins. D.L. Palmquist measured lipid metabolism and utilization of dietary fat, leading to development of calcium soaps as an energy supplement for dairy cows. M.L. Eastridge has led studies in application of feeding systems. W. Harvey, F. Allaire and St-Pierre contributed fundamental knowledge on statistical models for research and management decisions. Other leaders: N. Fehhheimer, chromosome aberrations, for which he was named a University scholar; N.L. VanDemark and R. Gomes, physiology of testes; J. L. Pate, expression of histocompatibility complex on corpus luteum; T.

Ludwick, artificial insemination; F.L. Schanbacher, lactoferrin and milk proteins; and L.B. Willett, environmental contaminants in milk. Dairy faculty are recipients of 20 ADSA awards and 3 have been recognized as Fellows. F. Ely was ADSA president (1947-48) and Sutton, G.H. Schmidt and Weiss were editors of *J. Dairy Science*. OSU hosted ADSA annual meetings in 1938, 1968 and 1992.

C15 100 Years of Dairy Science at Oklahoma State University. S. E. Gilliland*, *Oklahoma State University, Stillwater.*

The land grant university, presently known as Oklahoma State University, was founded more than 100 years ago in 1890 in Stillwater, Oklahoma Territory. Early in its existence dairying was included in the Agriculture Department. Through the dairy program the frontier farmers were encouraged to have a few extra milk cows. This allowed more milk to be produced than needed by the farmer and his family so cream could be collected for sale to local cream stations. This also provided another cash crop for the farmers, which provided enough extra income to avoid the need for loans to get them through the year. The first dairy building was constructed in 1904, and a separate Department of Dairying was formed in 1906. One of the main activities of the department in relation to people in the state was to promote the expansion of the use of separators and cream production much of which was churned into butter. Thus, butter making was an important component of the class work. The college creamery provided space for these practical laboratory courses, where separation and churning were taught. In 1905, there were only about 5 dairy processing plants in the Territory. By 1907 there were 50 such plants largely due to the efforts of the college. By 1951 there were close to 150 plants with at least one in every town of any size, especially the county seats. Today there are only 10 plants, but the total amount of milk processed is greater than in 1951. The number of dairy cattle, like in other states, has decreased since the 1950s, but the total amount of milk produced per cow has increased. Today, more milk is processed in the state than is produced. The dairy program, since 1968, is in the Department of Animal Science. There are fewer positions designated as being strictly dairy oriented since the Department has moved more toward a discipline orientation. There are four faculty members whose appointment has dairy activities. The needs of larger processing plants and larger dairy farms are much different than the small operations existing 100 years ago. The establishment of the Oklahoma Food & Agricultural Products Center provides processors and/or people interested in starting a processing business a place to obtain needed technical or business-related assistance.

C16 100 years of dairy science at Oregon State University. M. J. Gamroth* and L. Goddik, *Oregon State University, Corvallis.*

The present Oregon State University started in 1868 as a small private college near Corvallis. Its development parallels that of the American Dairy Science Association. The Dairy Husbandry department was formed one year after ADSA and has grown steadily. In 1907, the Departments of Agronomy, Animal Husbandry, Dairy Husbandry, and Poultry Husbandry were formed. Instruction tended to be a "hands-on" experience, and the 1908 college catalog noted, "The courses offered in this (Animal Husbandry) department embrace in a direct and practical way the teaching of specific subjects related to breeding, feeding,

and general management of livestock." Over the years, the dairy production and processing faculty have worked hard for the industry. Many are ADSA award winners and all have been active in the Association.

C17 The Penn State Dairy Science Club--celebrating decades of excellence. J. Bechtel*, D. Wilson, D. Olver, and R. Kensinger, *Pennsylvania State University, University Park.*

The Penn State Dairy Science Club has been an integral part of the educational experience for thousands of students interested in the dairy industry. The origin of the Club can be traced to 1923, the year of the first Penn State Dairy Exposition. This event is the Club's longest-running event, followed closely by the Spring Judging Contest established in 1925. The Penn State Dairy Science Club has been successful in honoring traditional activities such as the Dairy Expo while maintaining flexibility by sponsoring new events for dairy youth and Club members. The Club's current activities include a mixture of member education, youth involvement, industry and public service, and fundraising activities. The initiation of the holiday cheese sale in 1979 allowed the club to raise funds for trips and other educational initiatives. Since 1979, the Club has traveled to thirty-eight states and three countries for spring trips, ADSA Student Affiliate Division conventions, and Northeast ASAS/ADSA (NESA) student meetings. International trips have included travels to Ireland/Northern Ireland, Argentina, Canada, and a planned visit to New Zealand in 2007. The Club has enjoyed a long history with the ADSA Student Affiliate Division. Since 1984 the Club has placed first twelve times, second nine times, and third once in the Outstanding Chapter competition. Since 1977, six Penn State students have served as ADSA-SAD President, with the most recent, Emily Yeiser, completing her term at these Minneapolis meetings. Six Penn State students have been named Outstanding Student Affiliate Member. Ten Penn State students have earned first place in the Undergraduate Presentation Contest since 1990, and twenty-five members have served as ADSA-SAD national officers since 1961. Two faculty members, Lawrence Muller and Dale Olver, have been named Outstanding Advisor. Additionally, Penn State has won the first five ADSA Dairy Quiz Bowl contests. At the Northeastern Student Affiliate (NESA) meetings of ASAS/ADSA, Penn State has been named first-place institution thirteen times since 1990, and ten members have been named Outstanding Senior over the last sixteen years. Over the years the Penn State Dairy Science Club has partnered with various organizations in many industry-related activities. The Nittany Lion Fall Classic was established with the Pennsylvania Holstein Association in 1984, with over two million dollars of cattle marketed through this sale since its inception. In 1986 the Club assumed the responsibility of coordinating the Pennsylvania Holstein Quiz Bowl Contest at the Pennsylvania Junior Holstein Convention. This event typically attracts forty teams from around the state. In 2005 the Club held the first Penn State Dairy Days/Cow Camp, with industry groups providing excellent sponsorship for this activity. Over the last decade the Club has increased its public service events. In 1997, the Centre County Youth Services Bureau and Dairy Science Club partnered to offer the Spring Bargain Fling, a rummage sale that has earned over \$100,000 for Big Brothers/Big Sisters in the central Pennsylvania region. The first Osteochallenge Fun Run, a benefit for the National Osteoporosis Foundation, was held in October 2003. In the early years of the Club, most of the members were from dairy farms; currently a large portion of the Club's membership consists of students from a wide variety of majors, interests, and backgrounds.

Each generation of students and dairy youth benefits from the Club's activities, and the next decades should be equally exciting as the first eighty-three years.

C18 Penn State: The Second Land-Grant University. R. Pruyne, L. Muller, R. Kensinger*, and M. O'Connor, *Pennsylvania State University, University Park.*

Chartered in 1855 and designated as the second land-grant institution in the United States in 1863, Penn State has been noted for agricultural research and education for more than 150 years. Dairy research at Penn State gained recognition in 1887 with Henry Armsby's studies of energy metabolism using the Calorimeter. This work heralded the beginning of more than 100 years of dairy research and educational programs designed to assist the industry in the areas of animal breeding and reproduction, nutrition, health, growth, housing, milk synthesis, and dairy manufacturing. Penn State gained international attention with its dairy cattle nutrition studies, research in artificial insemination and dairy cattle fertility, and determination of the actions of bovine somatotropin. Penn State researchers were the first to use gas-liquid chromatography to characterize milk fatty acids and were among the first to identify lipids as a factor in heart disease. In the 1970s, they published research linking somatic cell counts with mastitis, and helped incorporate its use in testing programs. From the 1950s through the 1990s, studies of milk processing significantly extended the shelf life of dairy products. Penn State faculty established the first forage testing laboratory, and developing the current NIR technology used in forage-testing. Related research led to numerous publications, resources, and tools for evaluating pasture and forage and for monitoring calf and heifer growth. Penn State also was a pioneer in certificate programs, correspondence courses, and extension education. Statewide efforts in cattle breeding included the establishment of AI organizations, progeny testing, and Dairy Herd Improvement Associations. The Dairy Production Medicine Certificate Program was the first continuing educational program in the United States for bovine practitioners that emphasized management concepts. The University's Ice Cream Short Course, begun in 1894, is the oldest food technology and technical course in the world. Penn State also takes a keen interest in educating undergraduate students, as is evidenced by their many notable achievements. For more information about Penn State's Department of Dairy and Animal Science, see das.psu.edu.

C19 A Century of Dairy Science at Purdue University. J. Chambers*, *Purdue University, West Lafayette, IN.*

During the organizational year of the American Dairy Science Association (ADSA), Otto F. Hunziker led the dairy program at Purdue University. A charter member of ADSA and its third president, Dr. Hunziker's brilliant career as a scientist, teacher and author is recognized throughout the world. At Purdue he provided leadership in developing educational programs to better educate dairymen. His research programs established the accuracy of glassware and provided standard methods for the Babcock fat test of milk and cream. He planned Smith Hall, which was built in 1913 to provide facilities for teaching, research and extension work. Ollie E. Reed, ADSA's 1946 Borden Award recipient, established the Purdue dairy farm in 1919 for the purpose of instruction and research in milk production and dairy

herd management. From 1921-1960, Howard W. Gregory led Purdue's Dairy Department and served ADSA as president in 1937. He worked tirelessly on outreach programs, publications, training and educational services to the dairy community. Elliot H. Parfitt, whose research is well recorded in ADSA journals, served Purdue for 17 years as a dairy bacteriologist. His sanitizing protocol eventually became adopted by the Indiana State Board of Health. Another Purdue notable, Fredrick J. Babel, left a legacy of knowledge for researchers and management in the dairy food industry. His long list of teaching awards, including the 1973 ADSA Kraft Teaching Award, stands as a testimony to the excellence and popularity of this professor. The 1973 ADSA Borden Award recipient, Thomas W. Keenan, left his mark at Purdue as a biochemist with an emphasis on cell physiology. In 1983 faculties from Animal Sciences, Horticulture and Agronomy combined to form the Food Science Department, headed by Philip E. Nelson. Outreach programs, led by James V. Chambers, ADSA's 1992 DeLaval Dairy Extension Award recipient, focused on contemporary issues facing the dairy industry, such as antibiotic avoidance and municipal sewer use ordinances. During the final decade of Purdue's dairy science century, a new food science building was constructed. In 2004, S. Suzanne Nielsen became Department Head and continues to mentor the traditional successes of the Purdue University Food Science Department. Demand for Purdue food science students remains high within the dairy and food industries.

C20 Highlights of Dairy Production at Purdue University. M. M. Schutz*, B. R. Baumgardt, and J. L. Albright, *Purdue University, West Lafayette, IN.*

'Progress in a new field of science is always much easier and faster if someone has made a path', L.A. Rogers – ADSA Meetings 1938. At Purdue, W.C. Latta, 'The Grand Old Man of Purdue University and Indiana Agriculture', led the way for extension (1889-1923). C.S. Plumb began dairy production in 1890 as a Professor of Animal Industry and Dairying and later became Director of the Agricultural Experiment Station until 1902. He was the founder of the existing Indiana State Dairy Association in 1891 which furnished the main leadership for dairy farmers for the next 20 years. Plumb was a pioneer for humane treatment, dehorning and housing of dairy cows. The first Head of the Dairy Husbandry Department and a charter member of ADSA was O.F. Hunziker (1905-1917). He was followed by O.E. Reed (1917-1921), who developed the first Purdue University dairy farm in 1919, and H.W. Gregory (1921-1960). During Gregory's tenure there was heavy emphasis on dairy manufacturing. Smith Hall and the Purdue Creamery were completed in 1914 and housed dairy faculty and staff for over 60 years. F.W. Andrews succeeded him and soon became the first Head of the combined Animal Sciences Department (1960-1963) with a future plan for hiring dairy scientists. Faculty hired in the 1960's earned ADSA major awards such as Borden, Extension, Management, Physiology, Reproduction, and Teaching, and Fellows. Subsequent Heads of the Animal Sciences Department were J.L. Krider (1963-1971), W.R. Woods (1971-1986), B.G. Harmon (1986-1997), J.D. Armstrong (1997-2001), and A.L. Grant (2001-to present). The first three Department Heads were ADSA Presidents, as were dairy scientists R.E. Erb and B.R. Baumgardt later. Research prominence has been in nutrition, management, reproduction, endocrinology, genetics, behavior and well-being with teaching and extension efforts to complement these areas. Unique educational relationships exist between Purdue University and the many large dairies that recently have come to Indiana.

C21 A century of dairy research, teaching and extension. J. E. Wohlt*, H. D. Hafs, and M. L. Westendorf, *Rutgers, The State University of New Jersey, New Brunswick*.

The Rutgers farm was established in 1861, and George H. Cook issued the first dairy cattle feeding publications in 1881. Legislation in 1875 required inspection of dairy farms and plants, specified that the Experiment Station was responsible for official analyses of milk products, and stimulated investigations into factors that affected milk production and composition. Feeds and nutrition were one focus of early research by Edward Voorhees beginning in 1883. Clarence Lane, Rutgers' first Dairy Husbandman, pioneered (1896-1902) investigations of alfalfa for dairy cattle. Silage and silos have been a continuous focus of Rutgers research since 1881. The first silo was erected in 1883, and a round barn constructed in 1948 had a self-feeding central silo. In addition to the alfalfa trials, Carl Bender and his colleagues published (1921-1940) numerous articles on several grasses and grains for silage, some together with legumes. William Regan initiated pioneering inbreeding studies with the Rutgers Jersey herd, and transferred 33 with him when he joined the University of California in 1923. John Bartlett used inbreeding to improve both milk and butter production in the Rutgers Holsteins. Based upon his observations of the industry in Denmark in 1937, Enos Perry organized the first US artificial insemination cooperative near Clinton, NJ, on May 17, 1938. The first calf from AI in the US was born (February 15, 1939) on the Richard Schomp farm near Stanton, NJ. Joe Evans was one of the first to explore replacing ration protein with urea, Jim Wohlt demonstrated that yeast increased intake of corn silage rations, and Ralph Reece pioneered hormone research in dairy cattle. He also exemplified training at Rutgers; his student H. Allen Tucker published over 250 peer-reviewed papers, and in 2004 had over 70 of his own scientific successors. The Animal Science Image Gallery (www.anscgallery.nal.usda.gov) is led by Rutgers, and Rutgers' modern heifer facilities accommodate replacements for a single herd shared with the University of Delaware, as well as replacements for the University of Pennsylvania.

C22 More than 100 Years of Dairy Science at South Dakota State University. Dairy Science Faculty*, *South Dakota State University, Brookings*.

The first dairy courses were taught at the South Dakota Agricultural College in 1890, nine years after the territorial legislature established the College, one year after South Dakota became a state, and 16 years before the American Dairy Science Association was formed. The Dairy Husbandry Department was officially formed in 1907 with its name changed to the Dairy Science Department in 1964. The Department always had research and teaching programs in both dairy production and dairy foods, one of the few departments of that type in the nation today, and is the recognized leader in training students for careers in the dairy industry. SDSU students competed in the first undergraduate dairy cattle and dairy foods judging contest in 1916 and in virtually all of the contests since then, being national champions 15 times in the dairy foods division. Creamery short courses were prominent from 1900 until the 1950s. During the 1960s, major dairy processing in the state and region turned from butter to cheese. Today SDSU scientists are among the leading cheese researchers in the world and a part of the Minnesota – South Dakota Dairy Foods Research Center, one of the six national centers formed in the 1980s. In 1910, the department led the nation in research on mechanical milking machines. Two classic SDSU bacterial studies in the 1920s paved the way for later mastitis research. In the 1930s, scientists made important contributions about

vitamin A and D requirements of dairy cows. The first milking parlor in South Dakota was installed in the SDSU dairy barn in 1941. SDSU scientists were the first in the nation to house calves in individual outdoor hutches, a practice that greatly reduced calf losses. During the past 30 years, SDSU dairy scientists became acknowledged world leaders in whey utilization research, both in dairy foods and in livestock feeds. Today the department is a recognized leader in the use of distillers grains and other byproduct feeds for dairy cattle as well as in methods to modify the composition of milk for increased marketability and consumer health. Much of the SDSU research starts at the farm and continues with evaluations of dairy products in the department's processing plant, a true "cow to consumer" approach to dairy research.

C23 SDSU Dairy Club "Snapshots from the Past". A. Wirt*, *South Dakota State University Dairy Club, Brookings*.

The SDSU Dairy Club is well-known for their scholarship, leadership, and service. The club is comprised of dairy production, dairy manufacturing, and other students interested in the dairy industry. The SDSU dairy club was chartered in 1946. Since the charter many activities have been started including the following: dairy club formal, cheesebox sales, dairy camp, the all-breeds sale, dairy challenge, dairy digest, and showing at the SD State Fair. One of the most unique activities the SDSU Dairy Club does is cheesebox sales. Every fall, all SDSU Dairy club members gather together to manufacture cheese and sell the wholesome product to family, friends, and community members. Cheeseboxes are sent all over the U.S.A., from Hawaii to the New England States and Florida to Alaska. This fundraiser is extremely profitable and was started over 40 years ago. Dairy production and dairy manufacturing students are given the opportunity to experience both sides of the dairy industry through cheesebox sales and the all-breeds sale every year. The Dairy Club usually travels to the World Dairy Expo; Midwest and/or National ADSA conferences; the Central Plains Dairy Expo; the Canadian Royal; Mt. Rushmore; and various other clinics and places in any given year. SDSU Dairy Club members have enjoyed bonding together by having fun activities planned after each meeting including the following: paintball, ice skating, bowling, bonfires, dances, and creating a Hobo Day Float every year. Also, each member has the opportunity to build showmanship and fitting techniques by participating in the Little International Contest. Sometimes there are stubborn heifers which have even been ridden in past years. Dairy club members also enjoy putting on the SDSU Dairy Club Dairy Camp for younger students. It is a great time to strengthen the youth of the dairy industry and embolden the leadership abilities of dairy club members. Finally, the Dairy Club has had past South Dakota Dairy Princesses, Minnesota Princess Kay of the Milky Ways, and runner-ups for both as members of the dairy club. The SDSU Dairy Club is a thriving group and will continue to prosper and succeed in the future!

C24 100 Years of Dairy Science at Texas A&M University. M. A. Tomaszewski*, E. Jordan, and H. O. Kunkel, *Texas A&M University, College Station*.

Texas A&M University has a long history of research, teaching and public service programs that have benefited the dairy industry. Early courses in agriculture included feeding and care of the milking herd

and manufacture of butter and cheese. Robert E. Thweatt was hired as the first full time instructor in dairying and foreman of the creamery work in 1903. The Department of Dairy Husbandry was established in 1911 and in 1916 new facilities were built for a herd of registered Jerseys, Holsteins and Ayrshires. Pioneering research on dairy cattle management, nutrition, microbiology, milk composition and nutrition has had a global impact on understanding the inheritance of production and other genetic traits, requirements and supply of nutrients, reproduction, genetic improvement, and new and innovative dairy products. Various educational methods from hands-on-teaching to the first use of computers in dairy management courses to the use of the internet have been used to train future leaders of the dairy industry. Former students now hold prestigious positions in universities and industry and are establishing excellent records of achievement in research, teaching, and service to the dairy industry. Texas A&M faculty members have been instrumental in establishing mechanisms to provide up-to-date information to dairy producers. Faculty members were leaders in establishing state breed association, the Southern Regional Dairy Records Processing Center, National Dairy Data Base, reproductive programs and decision support systems that have had a national impact on the dairy industry. Faculty have held various offices in the American Dairy Science Association, including Presidents Walter Rupel and Ron Richter. Because of their contributions faculty and students have been the recipients of numerous awards.

C25 100 years of Dairy Science at the University of Alberta.

M. Oba, C. Strawson*, P. Jelen, and J. Kennelly, *University of Alberta, Edmonton, Alberta, Canada.*

The University of Alberta has worked closely with stakeholders in dairy industry. Feeders' Day began in 1922 and grew with an attendance of 1,500 in 1960's. This is the effort that University made in early 1900's to disseminate the research outcomes to livestock producers. In 1982, Dr. John Kennelly organized the first Western Canadian Dairy Seminar, which is now one of the most prestigious conferences for the North American dairy industry with about 700 attending annually. The WCDS has significant impacts on the efficiency and sustainability of the dairy industry in Western Canada. The dairy processing program at the U of A was founded by Provincial Dairy Commissioner, Dr. Marker, who offered short-courses in dairying for WW I veterans. The University of Alberta played a lead role in Dairy Foods Science in the early 1900's, and Dr. deMan earned one of the first 20 PhDs awarded at the U of A in 1958 - the first Canadian PhD awarded for dairy research. The first U of A Dairy Judging team was formed in 1978 and trained by Dr. Jelen. Since then, only once in almost 30 years did the Alberta team fail to place ahead of any other Canadian team. The U of A serves as the home of the editorial office for the International Dairy Journal with Dr. Jelen as Editor-in-Chief. In 1988, the U of A hosted the 83rd annual ADSA meeting in Edmonton. The Dairy Foods and Production programs have worked together more closely since 1994 with creation of the Department of Agriculture, Food, and Nutritional Sciences. It is also noteworthy that a partnership was created among the U of A, Alberta Agriculture, Food and Rural Development (provincial government), and Alberta Milk (dairy producer organization) to establish the Dairy Research and Technology Centre (DRTC) in 1997. This union brought together the resources of all partners with the vision to be Canada's leading centre for excellence in dairy research, teaching, and technology transfer. The DRTC is a symbol of the U of A's efforts to work intimately with provincial government and stakeholders in the industry.

C26 Contributions by the University of Florida toward improving the efficiency of dairy cattle production. B. C. do Amaral*, L. A. de Castro e Paula, and F. D. Jousan, *University of Florida, Gainesville.*

In an effort to improve the efficiency of dairy cattle production, the University of Florida provides producers with information, support and leadership for the continued economic development and sustainability of the dairy industry. Dietary supplementation of lipids allowed for improved production and reproductive performance of dairy cows, especially during the summer. Other contributions in nutrition include use of citrus pulp as an energy source and DCAD diets for cows in the transition period and the realization of the importance of mineral nutrition in the summer. A greater understanding of the physiology and endocrinology of the estrous cycle and ovarian function has led to the development of reproductive management tools for synchronizing estrus for timed insemination. In addition, pioneering work led to the discovery of interferon-tau as the key protein involved in maternal recognition of pregnancy. Shortening of the dry period increased milk income and reduced the incidence of disorders associated with transition cows as they initiate a new lactation. Studies with bST in lactating cows helped with its promotion and utilization to increase milk yield and allowed for increased profit margins of dairy enterprises. Realization that heat stress reduced the establishment and maintenance of pregnancy and lowered milk production led to studies to improve the ability of lactating cows to regulate their body temperature. These efforts included improving housing conditions through the use of shade, fans, sprinklers, water application rates, and cooling ponds and identification of the "slick hair" gene involved in thermoregulation. Incorporation of timed artificial insemination to eliminate heat detection and utilization of timed embryo transfer to bypass the sensitivity of early embryos to elevated temperature are management strategies used by producers to increase pregnancy rates in the summer. The Dairy Science program continues to improve dairy cattle efficiency while maximizing milk production and developing solutions for the changing needs of the dairy industry.

C27 100+ Years of Dairy Foods Research, Teaching and Extension at the University of Guelph. H. D. Goff* and D. W. Stanley, *University of Guelph, Guelph, ON, Canada.*

The Ontario Agricultural College was founded in 1874. It was one of the founding colleges of the University of Guelph in 1964. The Dept. of Dairying was established in 1885. It sent across the province a 'dairy train' in 1891, equipped to demonstrate new techniques of manufacture of dairy products both in the factory and on the farm. Recognition of the demand for further training led to the establishment of a 3-month dairy school in 1893, which continued until 1969. Two-year diplomas and 4-year degrees were offered by the Dept. of Dairying beginning in 1886. Prof. H. Dean, Chair from 1891-1932, was a founding member of ADSA in 1906. One of the outstanding dairy foods research contributions from this Dept. was the development of rapid analytical compositional testing methods, leading to the first infrared milk analyzer-equipped central milk testing laboratory in the world, established at Guelph in 1967. Industry training courses in cheese technology have run continuously since 1891 (first as part of the dairy school, then as a stand-alone course since 1969) and in ice cream technology as a stand-alone course since 1914. Today, the Dept. of Food Science hosts two Industrial Research Chairs in dairy foods, carrying on the legacy of 100+ years of dairy science at Guelph.

C28 100 Years of Dairy Science at the University of Illinois. J. Clark* and J. Baltz, *University of Illinois, Urbana-Champaign.*

Faculty from the University of Illinois are noted for their service to the American Dairy Science Association (ADSA). The ADSA was organized July 17, 1906, at the University of Illinois. W.J. Frazer, Instructor of Dairying, who was later hailed as the "Father" of ADSA called the first meeting to order. Five faculty members (H.A. Ruehe, 1936; P.H. Tracy, 1948; J.R. Campbell, 1981; J.H. Clark, 1993; M.F. Hutjens, 2005) have served as President of ADSA. The University of Illinois has a long history of research, teaching, and public service programs that have benefitted the dairy industry. Research began on milk production and composition in 1870. W.J. Frazer was hired in 1896 as the first full-time Instructor of Dairying and the Department of Dairy Husbandry was established in 1902. Pioneering research on dairy cattle biochemistry, genetics, management, microbiology, nutrition, and physiology has had a global impact on understanding synthesis and secretion of milk, inheritance of production and other genetic traits, ruminal fermentation, requirements and supply of nutrients, reproduction and artificial insemination, and automation of dairy farms. Everything from hands-on-teaching to the first dairy science class ever taught over the internet has been used to train future leaders of the dairy industry and ADSA. Former students now hold prestigious positions in universities and industry and are establishing excellent records of achievement in research, teaching, and service to the dairy industry. University of Illinois faculty members have been instrumental in establishing mechanisms to provide up-to-date information to dairy producers. Faculty members were leaders in establishing the Dairy Herd Improvement Association, the Weight-A-Day-A-Month Plan, and the National Dairy Data Base that have had a national impact on the dairy industry. Because of their contributions faculty and students have been recipients of 46 National ADSA Awards, numerous awards from other organizations, and four faculty members (G.W. Salisbury, C.R. Henderson, M.P. Bryant, D.E. Bauman) have been elected to membership in the National Academy of Sciences.

C29 100 Years of ADSA-SAD at the University of Illinois Illini Dairy Club. G. McCoy*, *University of Illinois, Urbana-Champaign.*

The Illini Dairy Club was founded in approximately 1922. Members of the Illini Dairy Club have been active leaders to promote the dairy industry locally, regionally, and nationally. Since organization of the ADSA-SAD four Illini club members have been elected President of Midwest ADSA-SAD (Mark McGuire, 1982; Chris Embry, 1990; Albert Lenkaitis, 1994; Julie Drendel, 2005) and 12 club members have been elected to National ADSA-SAD offices including two members as President (Mark McGuire, 1983-84; Andrew Lenkaitis, 2004-05). Six former Illini club members have served as President of ADSA (H.A. Ruehe, 1936; P.H. Tracy, 1948; G.A. Muck, 1980; R.W. Hemken, 1995; L.D. Muller, 1999; D.J. Schingoethe, 2001). Ed Jaster (1991) and Gene McCoy (2003) have been selected as National ADSA-SAD Outstanding Advisors. The club hosted the organizational meeting of the Midwest ADSA-SAD in 1982 and two later meetings in 1995 and 2001. Sixty-five students from 11 clubs attended the first meeting and by 1995 attendance had increased to over 400 students from throughout the midwest. For the past 23 years, the club has had a Milk-A-Cow booth at the Illinois State Fair where over 7000 people each year milked a cow and learned about the dairy industry and the nutritional value of dairy products. Cheese sales, managing the Purebred Dairy Cattle Association calf sales for 57 years, and hosting alumni golf

outings are other activities that provide an opportunity to learn from purebred breeders, renew friendships, and raise funds for the club and the dairy cattle judging team. Friendly competition is enjoyed at collegiate dairy judging contests and quiz bowl contests. Illinois was the winner of the National Collegiate Dairy Judging Team Contest in 1936, 1970, 1991, and 1999 and the Quiz Bowl Team placed first at the Midwest contest for several years and placed second in the national contest from 2001 to 2005. Management techniques and new technologies used in the dairy industry have been observed while on trips to dairy farms and processing plants in the United States, Canada, Netherlands, New Zealand, and Argentina. Members are recognized for their achievements and families, friends, faculty, dairy producers, and others are thanked for their support at an annual awards banquet.

C30 Gopher Dairy Club. B. Hemmesch*, *University of Minnesota, St. Paul.*

Passion for the dairy industry has never been in short supply for dairy students at the University of Minnesota. The U of M St. Paul Campus has been home to dairy student organizations since the Dairy Club was organized in 1916 at the University Passion for the dairy industry has never been in short supply for dairy students at the University of Minnesota. The U of M St. Paul Campus has been home to dairy student organizations since the Dairy Club was organized in 1916 at the University's School of Agriculture for rural secondary school students. With the merger of the School of Agriculture in 1960, college students were members of the U of M St. Paul Dairy Science Club through the 50's and 60's. A 15 year hiatus without an organization for dairy students was too long for some. November 11, 1982 was the first meeting of 25 founding student members and faculty where a constitution and the name 'Gopher Dairy Club' were approved. Beginning advisors to the club were Dr. Bill Mudge and Dr. Les Hansen. Today, the club's highly successful sale of malts and ice cream cones by GDC members at the state fair funds several scholarships for incoming freshmen to the club, allowing members to attend regional and national ADSA meetings, in addition to a very unique travel scholarship opportunity for senior members to travel to California. Since 1992, GDC has organized the animals and reasons takers at both the MN State FFA and U of M FFA Invitational dairy judging contests. Also, for three days in June of 2003 club members took part in the inaugural Gopher Dairy Camp created to enlighten young show persons about fitting and showing dairy cattle. During the January break, GDC senior members have a unique opportunity to travel somewhere warm, explore the dairy industry in other parts of the country. Previous years' senior trip locales have included Washington, Florida and Hawaii. Current and future GDC seniors will tour dairy operations and sightsee in the California sunshine. The Gopher Dairy Club will continue to leave a legacy of positively influencing students with leadership development and building professional relationships for success in the dairy industry.

C31 100 Years of Dairy Science at the University of Minnesota. J. Linn*, *University of Minnesota, St. Paul.*

University of Minnesota faculty were pioneering presidents of the American Dairy Science Association (ADSA). In 1909, 2nd ADSA

President, Dr. C.H. Eckles began his term; he served a 2nd term in 1922. Dr. W.E. Petersen (1949) and S.T. Coulter (1964) were also ADSA Presidents. The dairy industry has seen positive outcomes from U of MN research, teaching and extension programs. Nutrition research began with T.L. Haecker, "Father of Minnesota Dairying" and inventor of the Haecker Feeding Standards (1913). Other discoveries were: importance of phosphorus in rations and intravenous calcium injection as milk fever cure. C.L. Cole inseminated a Holstein cow resulting in the 1st calf born from A.I. in N. America (1937). E.F. Graham was a pioneer in reproductive physiology research. His work in semen preservation, superovulation and egg transplantation was critical to A.I. industry success and herd improvement. Since 1964, a genetic unchanged line of Holsteins has been maintained for genetic and genomic research. Current research emphasizes: protein and forage nutrition of lactating cows, calf/heifer nutrition and management, low-input production systems and crossbreeding. A worldwide reputation for teaching excellence began with C.H. Eckles; in 1933 the entire USDA Bureau of Dairying and 16 university dairy dept. heads were former students. The tradition of educating dairy leaders continues today with former students holding high impact roles in industry and academia. Dairy judging teams have a national reputation for success. Faculty-led dairy extension programs historically have focused on DHIA records, cow and calf nutrition, stray voltage and genetics. More recent extension program expertise reside in nutrition, milk quality, youngstock and production management. For over 40 years, MN, WI, IA and IL have cooperatively developed extension education programs. Faculty serve professional dairy organizations nationally and regionally. Their contributions are frequently recognized with awards. ADSA awards have been conferred to 37 faculty and students.

C32 Advances in Dairy Manufacturing and Food Science at the University of Missouri-Columbia, 1902-2006. R. T. Marshall*, *University of Missouri, Columbia.*

The first Missouri Agricultural Experiment Station Bulletin about dairying was published in 1894. This bulletin explained how to care for milk and make butter. Beginning in the winter of 1895 the University offered a course in dairying, using the 1894 bulletin as one of its texts. An official department of dairy husbandry was approved in 1901, and C.H. Eckles was chosen as the first departmental head. Dairy manufacturing and processing were always an integral part of the department. Early classes included butter making, and Ice cream making with a dairy chemistry lab for milk analysis. Early research included the use of adsorption chromatography to show why butter color varies due to the carotene content of different forage sources. W.H.E. Reid and his students developed pioneer research on the texture of ice cream and W.S. Arbuckle later expanded on this research with his work on the microscopical and statistical analysis of texture and structure of ice cream due to composition, physical properties and processing methods. The 5th edition of the book 'Ice Cream' was written in 1996 by R.T. Marshall and W.S. Arbuckle. Later research on ice cream by Marshall and others investigated how fat and fat replacers affected the flavor and physical properties of ice cream. The department had a functional milk processing plant that sold milk, butter, cottage cheese and ice cream to the community from the early 1900s to 1972. This facility provided valuable hands-on learning and research opportunities for the University's students. From the late 1950s, research on bovine mastitis included studies on differences in milk quantity and composition due to mastitis and on the importance of routine milk tests to reduce the incidence of mammary gland infections.

In the 1970s and 80s, Marshall and his group studied the degradation of dairy foods by psychrotrophic bacteria. Today, student's can get a taste of the past at the University operated, Buck's Ice Cream Parlor, located in Eckles Hall.

C33 100 Years of Dairy Science at the University of Missouri-Columbia. F. Martz, J. R. Campbell, R. Ricketts, and J. N. Spain*, *University of Missouri, Columbia.*

In April, 1901, the Missouri Legislature approved the establishment of a department of dairy husbandry at the University of Missouri. C.H. Eckles, a founding member of ADSA, was chosen as the first department head. Eckles emphasized research, teaching, and extension education under his direction. In 1930, he was named one of 'The Ten Master Minds of Dairying'. Early research focused on high producing cows and increasing appetite as well as studies on butter composition. In 1927, C.W. Turner began research that focused on the endocrinology of milk secretion. His work was instrumental in understanding mammary gland anatomy and function. In 1928, Samuel Brody began his research on the growth and development of domestic animals. He authored the classic book, 'Bioenergetics and Growth'. In 1936, H.A. Herman began pioneer work with artificial insemination and the physical and biochemical characteristics of semen. From 1958-79, John Campbell initiated research focusing on the nutritional quality and potential of whey and waste paper. In 1975, Campbell and R.T. Marshall coauthored the book, 'The Science of Providing Milk for Man'. In the 60s and 70s F. Martz conducted research on forage quality. Nutritional studies continued with R. Belyea and his work on the nutritive quality of byproduct feeds. Using lower cost, byproduct feeds in dairy diets was an economical boost to the dairy industry. In the 1980s and 90s, A. Garverick explored the reproductive biology of cystic ovaries in dairy cattle. He later studied gene expression during the wave of follicular development. In 1990, J. Spain joined the faculty and developed the 100 day Contract management concept for cows during the transition period. In 1993, M.C. Lucy began his work at MU and has focused his research on the decline of fertility in dairy cattle, focusing on nutrient partitioning mechanisms and their interactions on the reproductive axis. Today, the Commercial Agriculture and Dairy Extension Programs continue to aid the local dairy industry with projects such as the Dairy Heifer Plan and a web site entitled, Missouri Dairymen's Resource Guide. Today, the University still follows Eckles' original vision to meet the needs of the industry through teaching, research and extension while emphasizing a sound scientific approach.

C34 The University of New Hampshire: 100 years of Teaching, Research, and Extension in Dairy Science. P. Erickson*, E. Shea, and T. Fairchild, *University of New Hampshire, Durham.*

The University of New Hampshire has a long history with the dairy industry. The New Hampshire College of Agriculture and Mechanic Arts got its start at Dartmouth College but moved to Durham in 1890 thanks to Ben Thompson who willed his farm to promote the cause of agriculture. In 1887 the New Hampshire Agricultural Experiment Station was established. Post World War 1, researchers E.G. Ritzman and N.F. Colovos studied energetics and metabolism of ruminants. By the 1930's, Ritzman and Colovos developed an apparatus for the collection of solid and liquid from cows in digestion studies. H.C.

Moore found that solids-not-fat can vary by feeds consumed by cows. K.S. Morrow was also involved in dairy cattle nutrition research, teaching and the improvement of the breeding herd. After WW II, H. A. Keener and G.P. Percival discovered Co deficiency in cattle. In the 1960's, J.B. Holter joined Colovos in the study of dairy cattle energetics. Beginning in the 1970's, C.G. Schwab, began studying the amino acid requirements of dairy cattle. In the 1970's, W.A. Condon began research on the function of the corpus luteum. Research investigating corpus luteum function continues with P.C.W. Tsang and D.H. Townson joining Condon. UNH has won the Holstein Progressive Breeder Award 46 times and placed several bulls in AI. In 1992, UNH developed a new Dairy Herd Management program and in 1997, it started a student -run teaching program known as CREAM. Research focus continues in the area of dairy nutrition. Cooperative extension continues to be an important source of information for dairy farmers. Future plans at UNH include the development of an organic dairy.

C35 100 Years of Dairy Science at the University of Tennessee (UT). G. W. Rogers*, M. J. Montgomery, and J. B. Cooper, *University of Tennessee, Knoxville*.

Tennessee dairying rebounded from the Civil War with the 1869 establishment of the Knoxville Experiment Station. By 1918 six courses in dairy farming were offered at UT and research focused on substituting different forages and grains in rations and on culling and controlling diseases, especially tuberculosis and milk fever. From 1921 to 1929 three additional experiment herds were established: West Tennessee, Middle Tennessee (two Jersey herds to compare Island Bred and native stock) and a U.S. Dairy Experiment Station (Jersey herd) in Marshall County (among 12,000 Jerseys in this county). Extension specialists helped import (1948-1949) train loads of Jerseys from Canada that were auctioned to 4-H members to improve herds; Holsteins were likewise purchased. Each year for 20 years starting in 1950, 50 to 60 Guernsey heifers were purchased with money borrowed from a Tennessee bank; these were auctioned on a 'cost-basis' to Tennessee 4-H members. Clyde Chappell (1965) was instrumental in assisting East Tennessee Artificial Breeders forming Select Sires Inc. In the 1960s seven pairs of identical twin Jerseys were used to compare fast fattening growth with leaner 'normal growth'; leaner heifers outmilked the fat ones. In 1972 the new Department of Animal Science was formed from Animal Husbandry and Dairying. In the 1970s and 1980s the Junior Dairy Project was one of the most outstanding in the nation. Leaders were L.O. Colebank, Clyde Chappell, William Miller, Ray Spann and Monty Montgomery. Since 1984 Dr. Stephen Oliver and his lab have achieved international recognition for research focused on milk quality and mastitis. With Dr. Lannett Edwards as the leader of the UT Cloning team, Millie became the first Jersey calf cloned from an adult somatic cell (2000) and in 2002 ten clones of a single adult Jersey cow were born. Research on dairy form/angularity (2005) by Drs. Gary Rogers and Chad Dechow has led to the selection of bulls that produce daughters that hold their body condition early in lactation.

C36 Celebrating a Century—1906 to 2006—of the University of Vermont Department of Animal Science. J. M. Smith*, *University of Vermont, Burlington*.

One hundred years ago, in June 1906, the University of Vermont set the cornerstone for Morrill Hall. Senator Justin Smith Morrill, memorialized by the Morrill Act of 1862, was from Strafford, Vermont. Without his efforts there may not have been a land grant college system and certainly not a Department of Animal Science at the University of Vermont. Initially Morrill Hall housed the Department of Agriculture, which achieved College status in 1911. The early development of what would become the Department of Animal Science was overseen by Howard B. Ellenberger. Dr. Ellenberger was also active on the national scene and was elected President of the American Dairy Science Association in 1931. He served as Department Chairman until 1949. Under Dean Carrigan, the College really began to grow and take a shape resembling what was present at the end of the 20th century. New buildings sprouted up including the Hills Agricultural Science Building, the Bertha Terrill Home Economics Building, and the Dairy Science Building, which was renamed the Carrigan Building in 1965, 8 years after Dean Carrigan retired. The Department of Animal Science called all of these home at one time or another, moving from Morrill to Hills to Carrigan and finally to its current home in Terrill. The Department has had many names, as well, originally being called the Department of Animal and Dairy Husbandry, later Animal and Dairy Science, then Animal Sciences, and recently took on the singular name, Animal Science. The dairy foods faculty members were an integral part of the department until 1998 when they joined the nutrition faculty in the newly formed Department of Nutrition and Food Sciences. Department notables include Henry V. Atherton, J. Woodrow Pankey, Jr., James G. Welch, Catherine W. Donnelly, Karen I. Plaut, and David E. Kerr. Along with its research accomplishments, the department is proud of its teaching and advising record. The first Joseph E. Carrigan Outstanding Teaching Award went to Animal Science Professor Lyndon E. Carew, Jr., in 1981. Dr. Carew has taught introductory nutrition since 1971, and created an internet-based nutrition course in the early 1980s. In the College of Agriculture and Life Sciences, Animal Science is the largest major, with 250 students.

C37 UW-Madison: A Century of Excellence in Education and Discovery. L. H. Schultz, D. A. Wieckert*, C. C. Olson, W. T. Howard, and D. P. Dickson, *University of Wisconsin, Madison*.

William A. Henry, the University of Wisconsin's first agriculture professor, provided scientific research to expand the state's dairy industry in the late 19th century. Using the university farm and the newly created experimental station, Henry promoted the use of round silos for storing feed during the winter. In 1887, Henry hired Stephen Babcock who developed the first test for butterfat. This test enabled cheese makers to give farmers a fair price for their milk. In 1886 the university offered its first winter agricultural "short course." Stephen Babcock established the nation's first "Dairy School" in 1890. Created with legislative support, these schools moved farmers from wheat production to dairying. In 1907, S.M. Babcock and E.B. Hart forged discovery of vitamins and essential trace minerals by feeding diets of single grains to dairy heifers. These experiments proved that nutrients other than fats, proteins, carbohydrates, and salts were necessary for

life and reproduction. In 1933 a farmer brought a bucket of blood to the UW from a cow that had died for no apparent reason. Professor K.P. Linn determined the cause of death was internal bleeding due to the presence of dicoumarol, in moldy sweet clover hay. Dicoumarol is still used as a rat poison and a blood thinner in humans. In the mid-1930's, Wisconsin's breed organizations petitioned Agriculture Dean C.L. Christensen to establish a Department of Dairy Husbandry. With full support of the state legislature, Christensen moved several extension faculty members specializing in dairy from Animal Husbandry to create the new department in 1938. Dr. E.E. Heizer, a Holstein specialist from Ohio became the first Chairman of Dairy Husbandry. The department changed names to Dairy Science in 1962. The National Dairy Cattle Congress in Waterloo, Iowa, experienced financial difficulties in the mid-1960's. Dr. J. W. Crowley and prominent dairy cattle breeders from Wisconsin established the World Dairy Expo in Madison. The first show, held in 1968, continues to be the premier dairy exposition in the world. With the recent discovery of 'Ovsynch' (timed AI) the Department of Dairy Science continues to be a leader in utilizing basic biology knowledge to solve practical problems of dairy producers.

C38 Dairying becomes a highlight of the Utah Rocky Mountains: Glimpses into a century of contributions in research, service and teaching at Utah State University. G. H. Richardson, R. Lamb, T. Dhiman, and D. J. McMahon*, *Utah State University, Logan.*

Founded as the Utah Agricultural College in 1888. John T. Caine, purchased purebred Jersey bulls to initiate dairy herd improvement. George B. Caine continued this dairy breeding providing a basis for Cache Valley Breeding Association, and in 1958 the Holstein bull Burkegov Inka Dekol was the nation's highest rated bull. Lyman Rich pioneered use of "business machines" for processing dairy herd improvement records and teamed with Bliss Crandall, College statistician, resulting in formation of the Dairy Herd Improvement (DHI) computing service. Ruebin Hill was a pioneer in measurement of cheese curd tension. From this beginning, evolved a long history of research and instrumentation on milk coagulation. A.J. Morris was head of the Dairy Manufacturing Department and was a master teacher. His students became leaders in industry, research and education. C. A. "Tony" Ernstrom was the driving force behind construction of the Nutrition and Food Sciences building at Utah State University. He was instrumental in organizing the National Dairy Board research program and he pioneered use of ultrafiltration of milk for manufacture of natural and process cheese. Utah State University evaluated one of the first infrared milk analyzers in the USA, and these are now the prime means for measuring milk composition. Gary Richardson helped develop a hand-held conductivity meter for rapid detection of mastitis that is in use throughout the world and invented external pH-controlled starter system. Based on Richardson's research, several Utah State students formed a company to provide cultures, media and external pH-controlled systems to the cheese industry. Apart from being the most economical starter system, it produced some of the best improvements in cheese quality in the past fifty years and is now used worldwide. In the 1970s, Rodney Brown and Tony Ernstrom spearheaded the development and use of milk component pricing, resulting in a dramatic improvement in the economics of cheese manufacture. Now today's dairy faculty at Utah State University are making their own contributions in the fields of enhanced fat composition of milk, lactic acid bacteria genomics, cheese chemistry and manufacture, and whey proteins.

C39 Virginia Dairy Foods Research Program. S. Duncan*, *Virginia Polytechnic Institute and State University, Blacksburg.*

The Virginia Tech Dairy Foods Research Program was started in 1986 by Dr. J. Russell Bishop. Funded by contributions from dairy food processors within the state, the program targeted extension, education and research programs that improved quality and safety of dairy foods. Early research activities focused on rapid detection methods for spoilage bacteria and translating that work to the benefit of the dairy food processors within the state. In the early 1990s, Dr. Bishop initiated research on the accuracy and efficiency of rapid analytical methods for drug residue detection in raw and processed milk products. Dr. Bishop also initiated the Virginia Dairy Quality Control Program, an annual meeting of processors and regulatory officials within Virginia, with a meeting objective of sharing the current research and education information needed for improving quality, processing and safety of dairy products. Leadership of the program changed with Dr. Bishop's transition to the Wisconsin Center for Dairy Research. The program is now led by Dr. Susan Duncan and Dr. Susan Sumner and includes faculty expertise in food safety, sensory evaluation, processing, packaging, and chemistry. The expertise has expanded to include aseptic and extended shelf-life processing, fermentations, product development, and packaging. The six faculty, three support staff, and seven graduate students invested in the program continue to meet program goals through extension activities and publications, applied research of critical importance within the Commonwealth and the nation, and education of the next generation of scientists and processors. Publication of the monthly Dairy Facts newsletter and other general education releases assists in reaching the targeted audience. Faculty, staff and students participate in the annual Capital Hill Ice Cream Party sponsored by IICA and IDFA, provide educational activities to K-12 children in 4-H, FFA and the Governor's School for Agriculture, directly deliver programs to processors on sanitation, HACCP, sensory and packaging, and support the Virginia Dairy Foundation and Virginia Dairymen activities at the state fair. Current research activities include inhibition of mold growth on cheese, improved packaging for preventing light-induced and autoxidation reactions in fluid milk and dairy products, preventing growth of pathogens in soft cheeses, and use of nanocrystalline cellulose complexed with whey proteins for food applications. These research activities are funded through external competitive grants complementing the base funding provided by the Virginia Dairy Foods Research Program and increasing the program value.

C40 Dairy Club of Virginia Tech: Capturing the Past, Defining the Future. J. L. Leech* and D. R. Winston, *Virginia Polytechnic Institute and State University, Blacksburg.*

The Dairy Club was organized at Virginia Polytechnic Institute in 1921, and was one of the three original curricular clubs on campus. The Dairy Club of Virginia Tech, as the organization is now known, has a past that is rich in history and achievement. In 1924 the Dairy Club published its first annual and sponsored Virginia Tech's first dairy judging team. The following year, 1925, the club held its first Little All-American Dairy Show. The Virginia Tech Dairy Club became a member of the American Dairy Science Association in 1938. In the years that followed the club has been recognized as the Outstanding Chapter of the ADSA - Student Affiliate Division more than any other chapter. Since 1960, six club members have served ADSA-SAD president and seven have been recognized as the ADSA-SAD

Outstanding Student. The club has enjoyed similar success in the Southern Branch, having been named the outstanding chapter 20 times since 1980. Today, the club is highly visible on campus through its milkshake sales at all home football and basketball games. The Dairy Club has made national news more than once. In 1971 the Little All American show was featured on NBC's Today Show and in 2005 a Virginia Tech Holstein calf named Shana made national headlines on ESPN and the Wall Street Journal for her ability to "predict" Hokie football game scores. The club is helping define the future by training dairy leaders through its activities that compliment the undergraduate curriculum in Dairy Science.

C41 The Past, Present, and Future of Dairy Science at Virginia Polytechnic Institute and State University. J. W. McFadden*, M. L. McGilliard, and C. E. Polan, *Virginia Polytechnic Institute and State University, Blacksburg.*

Virginia Polytechnic Institute and State University (Virginia Tech) is today taking steps to assure its scientific contributions to the dairy industry will continue well into the future. In 1895, William D. Saunders, a Virginia dairy industry pioneer, was the sole instructor of dairy science courses and was well-recognized for his contributions to cheese processing. Faculty member Charles W. Holdaway was a charter member and first president (1922 and 1923) of the Southern Branch of the American Dairy Science Association (ADSA). Since that era, five Virginia Tech faculty members have held the presidency of the Southern Branch of ADSA (Paul M. Reaves, W. Ray Murley, Carl E. Polan, J. Russell (Rusty) Bishop, and Robert E. James). The Department of Dairy Science has been home to a multitude of scientific innovators. The scholarly contributions of these scientists include body condition scoring, major advancements in protein supplementation for enhanced milk production, the improvement of reproductive efficiency through refinements in semen quality and artificial insemination and the development of a dairy feeding program based on forage testing, computerized ration balancing, and a total mixed ration approach. Virginia Tech was influential in the formation of several key industry organizations: the Virginia State Dairymen's Association (1907), the Virginia State Feed Association (1946), and the Professional Dairy Heifer Growers Association (1997). Since the late 1970's dairy

producers, through the Virginia Setaside program, have contributed more than \$5 million to departmental programs. A variety of dairy courses taught by a committed faculty has been the foundation of an enthusiastic Dairy Club that for many years has actively supported the Student Affiliate division of ADSA. The Department of Dairy Science recently completed the construction of modern dairy facilities and has hired three faculty members (Benjamin A. Corl, Mark D. Hanigan, and Isis K. Mullarky) to insure the continued growth and success of its research, teaching, and extension programs.

C42 West Central®: Practicing dairy-nutrition innovation for 50+ years!. P. W. Jardon*, *West Central, Ralston, IA.*

In 1933 West Central® was founded in Ralston, Iowa as Farmers Cooperative Association of Ralston. In the years since West Central has become known for dairy-nutrition innovation. In 1942 an expeller processor was installed in Ralston. In the 1980's computer modeling of dairy rations became more advanced and nutritionists started to become aware of the benefits of bypass protein. West central refined the expeller process to optimize bypass protein and in 1984 began marketing SoyPLUS® to the U.S. dairy industry. A patent was awarded in 1993 for the unique processing technology that included a new reaction and conditioning phase. SoyPLUS has become the 'Gold Standard' by which dairy products are compared. In 1997, SoyChlor®, a palatable chloride source for closeup dairy cattle, was developed using hydrochloric acid technology. West Central received a patent for the technology for producing SoyChlor in 2002. SoyChlor has become the industry standard of anionic DCAD products. In 1996 West Central began producing methyl esters and in 1997 began manufacturing and marketing SoyPOWER® premium biodiesel fuel. Today West Central is the nation's largest marketer of biodiesel. West Central is proud to be a Sustaining Member of ADSA. West Central consistently supports the dairy industry through funding of research and special projects. The science of amino acid nutrition, rumen protein dynamics, transition cow feeding & management, and young stock nutrition are just some of the areas that have been advanced by support from West Central. West Central would like to extend gratitude and thanks to everyone in the dairy and allied industries for making our success possible. Congratulations to ADSA for 100 great years!