W82 Assessing learning outcomes: A comprehensive dairy cattle nutrition curriculum for practicing veterinarians. G. M. Schuenemann*, M. L. Eastridge, W. P. Weiss, J. D. Workman, S. Bas, and P. Rajala-Schultz, *The Ohio State University*, *Columbus*.

The purpose of the study was to assess the effectiveness of a team-based educational program designed to enhance the flow of applied, research-based, nutrition information to dairy veterinarians. A comprehensive dairy cattle nutrition curriculum was developed and participants from 11 veterinary practices located in 5 states (IN, NY, PA, NM, and OH), serving an estimated 186,150 dairy cattle in 469 herds, attended the 2 advanced nutrition modules (~2.5 d each and ~40 h of learning) in 2009. Nutrients, feeding transition cows, calves, and heifers (ration formulation/interpretation), dry mater intake, feed storage, metabolic diseases, evaluating cows (BCS, manure and lameness), metabolic blood profiles, record-keeping systems and feeding behavior were discussed. Educational materials were delivered through in-class lectures followed by case-based learning and group discussions. A farm visit and an out-of-class assignment were implemented. Attendees were assessed using pre- and post-tests of knowledge to determine the level of knowledge gained in both nutrition modules. Participants evaluated the program and provided feedback at the conclusion of each module. Veterinarians (100%) reported that the overall program, presentations and discussions were useful. Attendees found the presented information relevant for their work (agree = 60% and strongly agree = 40%) and of great immediate use to them (neutral = 6.5%, agree = 56% and strongly agree = 37.5%). The presented materials and the implemented educational delivery methods substantially increased the knowledge level of the attendees (16.9% points increase from pre-test to post-test scores; $P < 0.05$). Importance of feed particle size, ration evaluation, interpreting feed analysis, carbohydrate components, and metabolic profiling in fresh cows were listed as learned concepts that participants could apply in their practices. Results suggested that both nutrition modules were relevant and effective, offering new information with immediate field application. This program has important implications for dairy veterinarians since they are a vital source of information for dairy producers.

Key Words: dairy cattle nutrition, veterinary, CE

W83 A self-powered smart wireless identification and tracking sensor prototype for production agriculture applications. K. Dhakal*[1], J. F. Keown[1], and H. Sharif[2], [1]*Department of Animal Science*, *University of Nebraska-Lincoln,* [2]*Department of Computer and Electronics Engineering*, *University of Nebraska-Lincoln*.

There is a need for animal identification (ID) and disease traceability for proper livestock health and its management. An innovative solution, radio frequency identification (RFID) ear tag, has been developed to meet the United States Department of Agriculture (USDA) animal disease traceability requirement. The RFID ear tag supports animal identification, data management and real-time health monitoring within a reasonable distance. The prototype ear tag is a self–powered and capable of complete identification and tracking functions within a mile. It also possesses an integrated health sensor to monitor real time temperature and pulse rate. Information on animal health, breeding and vaccination records can also be retrieved from these small, economical and remotely accessible tags. Research is currently being conducted on the distance that animal ID can be transmitted under differing weather conditions, topographic features, interference from other radio transmissions and other electronic equipment. The research will show if a secondary transmission system will be needed to intercept the initial transmission to have the information downloaded at a central computer receiving station. With encrypted information for data privacy and its ability to harness energy from solar, thermal, and vibration energy the RFID ear tag would bring major impact in national economy as well as impact on the animal industry both in the United States and internationally.

Key Words: RFID, smart tag, tracking

W84 Impact of the 2009 economic crisis on Idaho dairies. M. Chahine*[1], G. E. Shewmaker[1], R. J. Norell[2], and C. W. Gray[1], [1]*University of Idaho*, *Twin Falls*, [2]*University of Idaho*, *Idaho Falls*.

A mail-in survey was conducted to evaluate the impact of the 2009 economic situation on Idaho dairies and to identify trends in forage use. The survey was mailed to every dairy producer registered in the state of Idaho (n = 518). The PROCSURVEYMEANS of SAS (SAS Inst. Inc., Cary, NC) was utilized to produce estimates of survey proportion in each category. Dairies were categorized as small ($n \leq 200$ cows; 48.8%), medium-sized (n = 201 to 1000 cows; 30.2%) or large ($n \geq 1000$ cows; 21.0%). Of the 518 surveys mailed, 98 surveys were returned for a response rate of 19%. The largest number of survey participants represented small (48.8%) dairies followed by medium-sized (30.2%) and large (21.0%) dairies. Small dairies averaged 87 cows, medium-sized dairies averaged 518 cows, and large dairies averaged 1697 cows. All respondents were dairy owners that used alfalfa hay in their lactating cow′s ration. Twenty-six percent of respondents indicated that cost and/or price limited the use of alfalfa hay on their dairies. A smaller percentage of respondents cited quality (14%), constraints from nutritionists (14%) and supply (9%) as important factors. During the crisis, 35% of respondents reduced the amount of alfalfa hay stored on their dairy. No significant reduction was encountered in the amount of alfalfa hay used in the ration while minerals, vitamins, additives, grains, and protein supplements were reduced. Dairies economized by culling heavily, eliminating new equipment purchases and capital expenditures that do not have short-term pay offs, lowering medication costs, purchasing cheaper semen, trimming labor, reducing employee benefits, purchasing cheaper teat dips and keeping low inventory of supplies. We conclude that during the crisis, dairy producers reduced the inventory of alfalfa hay stored on their facilities but did not decrease the amount included in the ration. Other components of the ration were, however, reduced. Dairy producers implemented a wide range of cost savings techniques. Most dairy producers are still worried about the future of the dairy industry.

Key Words: dairy, economic crisis, forages

W85 Nuisance fly production capacity of three types of manure handling systems. G. E. Higginbotham*[1], A. C. Gerry[2], C. C. Collar[3], and L. D. Reed[4], [1]*University of California Cooperative Extension*, *Fresno,* [2]*University of California*, *Riverside,* [3]*University of California Cooperative Extension*, *Hanford,* [4]*513 Fortuna Ave.*, *Modesto, CA*.

As dairy farms grow larger, producers struggle with handling large volumes of manure. Most manure handling systems include solids separators to remove fibrous particles from water used to flush alleys in cow housing areas. Inclined screens or settling basins are most common. Conventional settling basins have earthen or solid concrete sides and

a wood slatted weir at one end for particle separation. A novel settling basin design called a weeping wall has 214 cm high sides constructed with slotted steel hog flooring panels secured into reinforced concrete pillars. Slot spacing is 10 mm allowing effluent to weep from the slots while containing fibrous particles. Composting manure solids is an increasingly common practice on dairies. In this study, production of larval flies in manure compost piles (CP), conventional settling basins (SB), and weeping wall basins (WW) were compared at 6 dairies (3 SB and 3 WW) in the Central Valley of California. Two of the WW dairies used duplicate WW basins and one of the SB dairies used a duplicate SB. The other 3 dairies used a SB system. During the fly breeding season from June–August, manure samples (>20; 4 L total) from each system were collected weekly near inflow and outflow sections. Manure samples were washed thru a 16 mesh screen with larvae collected and identified. The most abundant fly species for all systems was the false stable fly (*Muscina stabulans*), however each system also produced house flies (*Musca domestica*) and stable flies (*Stomoxys calcitrans*). There was no difference ($P > 0.1$) in larval fly abundance of either SB or WW. Of the 3 systems, manure compost piles produced fewer total flies ($P < 0.0001$), as well as fewer house and stable flies ($P < 0.01$). For all dairies, neither overall fly production nor production of house and stable flies was different ($P < 0.05$) between SB with or without a WW. The use of a WW did not result in an increase in the production of nuisance or biting flies.

Key Words: house fly, manure, dairy

W86 Examining the dairy workforce in order to improve labor efficiency. L. A. Holden*, R. E. Bechtel, and G. A. Varga, *Penn State University*, *University Park*.

This research was part of a larger project examining the needs of the dairy workforce. The objective of this research was to determine the labor efficiency and key practices in a sample of Pennsylvania dairies to recommend strategies for improving workforce needs and labor efficiency. Data was gathered via a mail survey with a small monetary incentive for return and a series of survey mailings, postcard reminders, second survey mailings and final postcard reminders. Surveys were sent to 881 dairies representing approximately 15% of the largest dairies that were most likely to have hired labor in Pennsylvania. The response rate was 296 usable surveys plus 86 returned that indicated no longer in dairying for a usable response rate of 33.6%. All respondents had a herd size of at least 50 cows and average herd size was 259 ± 165.0 (n = 278). The average number of acres rented was 358 ± 277.1 (n = 251) and acres owned was 356 ± 210.3 (n = 264). Cows per worker was 41 ± 15.5 (n = 205) and pounds of milk sold per worker was 807,277 (n = 174). The average compensation for milkers was reported as $9.98/hr ± 1.69 (n = 188) and for managers was $13.23/hr ± 3.16 (n = 79). When asked about new milkers hired in the past 5 years only 13.13% of dairy owners were very satisfied with the quality of applicants and only 7.0% were very satisfied with the skill level of new milkers. Only 15.48% (n = 239) indicated that milkers had written job descriptions and only 21.67% (n = 96) indicated that workers received a monetary bonus. Survey results indicate opportunities exist for improving workforce practices such as written job descriptions, standard operating procedures and training for new workers as well as overall labor efficiency to increase cows per worker and milk sold per worker.

Key Words: dairy workforce, labor efficiency

W87 Effect of bedding material on flies, and behavior and innate immunity of calves reared in hutches. K. D. Gay*[1], S. D. Eicher[2], C. S. Wilcox[1,2], J. A. Bridges[1], M. H. Rostagno[2], S. E. Charley[1], M. J. Grott[1], R. E. Williams[1], and M. M. Schutz[1], [1]*Purdue University*, *West Lafayette, IN*, [2]*USDA-ARS Livestock Behavior Research Unit*, *West Lafayette, IN*.

Dairy calf hutches are often bedded with straw (STR), but sand (SND) and wood shavings (SHV) are becoming more common. The objective was to compare 3 beddings for presence of flies and measures of innate immunity and behavior of calves. Hutches were blocked by location and each of 3 hutches in a block was randomly assigned 1 of 3 treatments; SND, STR, or SHV. Twenty-eight heifer calves in the study were assigned sequentially by birth date to the next available hutch. The study was during a moderate summer (June to September 2008) at the Purdue Dairy Research and Education Center. Calves were observed twice weekly from birth until being weaned at approximately 8.5 wk of age. Blood samples were taken weekly and leukocytes analyzed for phagocytic function, CD14 (part of the LPS receptor) and CD18 (adhesion molecule) surface expression. Twice weekly, flies were counted manually on inside surfaces of hutches and counted on each leg of the calf after rising immediately before behavior observations. Bedding samples were collected to measure the presence of immature flies. Statistical models for fly counts and blood samples considered week and treatment. The percentage of cells that phagocytized beads, was least in wk 6 and 8 ($P < 0.05$). The percentage of cells expressing CD14 or CD18 increased over time ($P < 0.001$) and STR bedding resulted in more fluorescence of CD18 than did SHV ($P < 0.04$). Hutch fly counts were lowest ($P < 0.02$), but larvae counts were highest ($P < 0.02$) in hutches bedded with STR. It appears SND, STR, or SHV are acceptable bedding materials during moderate summer conditions in the Midwest, but fly larvae counts must be managed with STR.

Key Words: bedding, calf, immunology

W88 Management practices utilized by high-producing Kentucky dairy herds. C. O. Coombs and J. M. Bewley*, *University of Kentucky*, *Lexington*.

Dairy producers often make decisions based on what other producers in their region are doing. The objective of this research was to summarize management practices utilized by Kentucky Holstein herds with rolling herd average milk production greater than 10,000 kg per cow (n = 21) using records obtained from the Dairy Herd Improvement Association. Interviews were conducted on-farm and over the phone. Herd size ranged from 25 to 1590 lactating cows with a mean (±SD) of 186.54 ± 317.22. Daily milk production per cow ranged from 25.95 to 39.59 kg with a mean (±SD) of 32.56 ± 3.44. Test day somatic cell count ranged from 102,000 to 432,000 cells per ml with a mean (±SD) of 256,140 ± 56,170. Average days in milk ranged from 132 to 260 with a mean (±SD) of 212.38 ± 29.7. Days to first service ranged from 69 to 150 with a mean (±SD) of 103.04 ± 23.56. Pregnancy rate ranged from 9% to 20% with a mean (±SD) of 13.6% ± 2.80%. The most common management practices utilized by these producers were regular forage testing (100%), regular utilization of veterinary services for reproductive management (100%), fans or sprinklers (90%), artificial insemination for genetic improvement of lactating cows (86%), artificial insemination on heifers (86%), annual ration balancing (81%), annual hoof trimming (81%), sexed semen (71%), separate far-off and close-up dry cows (67%). The most common mastitis prevention methods utilized were drying teats before attaching milking units (100%), dry treating all quarters at dry-off (100%), pre-dipping (95%), post-dipping (95%), gloves worn by employees (81%), and automatic take offs (81%). When asked to identify the management practice that contributed the most to their milk production level, the most frequently cited reasons were (1) quality for-

ages (n = 4), (2) paying attention to detail (n = 4), (3) cow comfort (n = 3), and (4) balanced rations (n = 3). Generally, farmers in this study achieved high milk production levels by following recommended best management practices, paying attention to detail, and striving for optimal nutrition, milk quality, and cow comfort.

Key Words: best management practices, high milk yield, dairy survey

W89 Organic milk production in Maine: Attributes, costs, and returns. P. S. Heacock*, A. L. Cook, G. K. Criner, and L. A. Bragg, *University of Maine*, *Orono*.

Nearly one quarter of all commercial dairy farms in the state of Maine are certified organic producers. The objective of this study was to assess the current management and financial status of organic producers in the state. Management and financial information was collected from 30 organic dairy producers that completed the 2007 dairy cost of production survey implemented by the University of Maine and the Maine Milk Commission. Summary descriptive statistics were calculated by herd size. The farms were divided by herd size into 3 groups, small, medium and large with 9, 10, and 11 farms in each group respectively. The mean herd size was 30, 55, and 100 for the small, medium, and large farms with annual milk shipped of 130,780 kg, 341,755 kg, and 607,834 kg respectively. This equates to annual milk shipped per cow of 4,359 kg, 6,213 kg, and 6,087 kg for the small, medium and large farms. All farms relied primarily on family labor however the medium and large farms also had a substantial amount of hired labor. Full-time labor equivalents (FTE) for the farm size groups were 1.5, 3.0, and 3.2, with a mean cows per FTE of 20, 18, and 31 for the small, medium and large farms. Annual revenue per cow was $2,801, $4,269 and $4,565 for the 3 farm sizes. Purchased concentrate was the largest expense for all 3 farm sizes, however there was little difference between the 3 groups, ranging from 35 to 37% of total annual costs. Annual operating costs on a per cow basis were $1,963, $2,757, and $2,682 with annual overhead costs per cow of $824, $769, and $829 for the small, medium and large farms respectively. The return to family labor and ownership per cow was $13, $743, and $1,054 for the 3 farm sizes. Milk production per cow was highly correlated with profitability. Results showed that the larger organic dairy farms in Maine are benefiting from economies of size while the smaller operations rely on on-farm diversification and off-farm income to remain viable.

Key Words: organic, finances, herd size

W90 Effectiveness of genetic evaluations in predicting daughter performance in individual herds. H. D. Norman[1], J. R. Wright*[1], C. D. Dechow[2], and R. C. Goodling Jr.[2], [1]*Animal Improvement Programs Laboratory, ARS, USDA*, *Beltsville, MD*, [2]*Pennsylvania State University*, *University Park*.

Response to genetic selection has been demonstrated nationally for US dairy cattle, but producers are more likely to appreciate the value of genetic selection if trends within their own herds can be shown. Responses from 2004 through 2008 in individual herds by Holstein and Jersey cows were documented for yield (milk, fat, and protein), somatic cell score, productive life, and daughter pregnancy rate. Sire and dam predicted transmitting abilities (PTA) or parent average (PA) from evaluations before first calvings were the independent variables, and phenotypic performance (standardized first-parity yields, somatic cell score, lifetime days milked, and days open) was the dependent variable. Minimum number of cows with usable records per herd was 50. Mean coefficients for regression of standardized yield on PA for the same trait was 0.73 for milk, 0.79 for fat, and 0.69 for protein for 8,257 Holstein herds and 0.79, 0.72, and 0.73 for 441 Jersey herds. The majority of individual herd regression coefficients for yield traits were between 0.3 and 1.0; their standard deviations were between 0.38 and 0.47. Regression coefficients may have been < 1.0 because PA was based on all-parity yield whereas phenotypic yield was only from first parity or because the heritability assumed for calculating PTA was too high. Mean regression coefficients for somatic cell score, productive life, and daughter pregnancy rate were 0.82, 0.65, and 0.81, respectively, for Holsteins and 0.65, 0.56, and 0.85 for Jerseys; their corresponding standard deviations were 0.66, 0.75, and 1.07 for Holsteins and 0.77, 0.80, and 1.14 for Jerseys. Mean coefficients for regression of sire PTA on phenotypic performance ranged from 0.53 to 0.80; mean regression coefficients for dam PTA ranged from 0.43 to 0.86. Although standard errors were large, response to genetic selection on a within-herd basis could be demonstrated, which should help increase confidence in national genetic evaluations.

Key Words: herd prediction, yield, fertility

W91 Winter feeding strategies for lactating organic dairy cows. P. S. Heacock*, D. P. Marcinkowski, G. W. Anderson, M. R. Stokes, and R. Kersbergen, *University of Maine*, *Orono*.

In northern climates, the highest feed costs for organic dairies are seen during the non-grazing season. The objective of this project was to examine the effects of different forage and concentrate systems on the nutrition, production and economics of winter-fed, organic dairy cows. Two organic forage systems were compared, the first consisting entirely of grass haylage (GH) and the second consisting of grass haylage and corn silage with other summer annuals (CS). Two concentrate supplementation methods were also compared, the first consisting of a commercially available pellet (P) and the second a mixture of homegrown grains and commodities (C). Four rations were developed to support 31.75 kg of milk/day. Each ration consisted of one forage and one concentrate option. Twenty-eight Holstein cows were divided into 4 groups and fed the 4 rations in a 4 × 4 Latin square design. All of the feeds fed were organically certified and the cows were managed organically for the duration of the project. Few production differences were found between the treatments. Daily energy-corrected milk (ECM) was similar, averaging 28.25 kg for the GH-C, 28.04 kg for CS-C, 27.31 kg for GH-P and 26.80 kg for the CS-P ($P > 0.05$). Milk fat was lower with the CS-C ration and there was a difference in milk urea nitrogen (MUN) between all 4 treatments with 17.27 mg/dL for the GH-P, 14.80 mg/dL for the GH-C, 12.52 mg/dL for the CS-C and 11.20 mg/dL for the CS-P ration. Feed costs and income over feed costs (IOFC) varied greatly between the treatments. Daily feed costs averaged $9.18, $9.03, $7.87 and $7.25 for the CS-P, CS-C, GH-P and GH-C respectively. IOFC was $7.47, $8.47, 9.08 and 10.27 for the CS-P, CS-C, GH-P and GH-C respectively. Organic dairy producers have fewer feeding options so they must rely on high quality forages and homegrown grains for the majority of their nutrient needs. Results showed a financial advantage to haylage diets when compared with corn silage diets due to the high cost of organic protein sources.

Key Words: organic, nutrition, feed cost

W92 A milker's school for international refugees resettled in Idaho. J. C. Dalton*[1], K. S. Jensen[2], R. Manzo[3], and L. Whiteford[3], [1]*University of Idaho*, *Caldwell*, [2]*University of Idaho*, *Owyhee County*, [3]*International Rescue Committee*, *Boise, ID*.

Each year approximately 1,000 documented, work-authorized refugees are resettled in Idaho. These refugees originate from over 20 different countries, and speak more than 27 different languages. At the request of the International Rescue Committee in Boise, Idaho, University of Idaho Extension developed an introductory-level milker's school for international refugees resettled in Idaho. The program consisted of 4 h of classroom teaching, and was held in Caldwell, Idaho. Topics included udder anatomy, cow preparation and sanitation, milk letdown, milk removal and milking unit handling, mastitis, prevention of antibiotic residues in bulk tank milk, milking systems, and the role of the dairy industry in Idaho's economy. All material was presented in English and translated for refugees from Burma, Somalia, Eritrea, Uzbekistan, Nepal, Iraq, Afghanistan, Togo, and Bhutan. In 2009, 4 milker's schools were conducted, with 128 refugees attending. A certificate of completion was awarded to all participants at the conclusion of the program. Sixteen refugees are currently working at a dairy in Oregon. In anticipation of emergence from the economic recession and stabilization of the dairy economy, further educational opportunities are planned, including calving management and artificial insemination schools, to provide refugees with additional marketable skills necessary to secure employment on dairies. The delivery of this program provided: 1) an educational opportunity for international refugees resettled in Idaho, 2) participants the knowledge and skills necessary to succeed as dairy employees, and 3) increased the diversity in University of Idaho Extension programs.

Key Words: milker, refugee, dairy

W93 Limitations and opportunities of beef and dairy operations for the use of ethanol co-products. J. I. Navarro*[1], L. J. Snyder[1], R. P. Lemenager[1], and S. L. Lake[2], [1]*Purdue University*, *West Lafayette, IN*, [2]*University of Wyoming*, *Laramie*.

A survey instrument was developed to assess the attitudes and the potential for bio-fuel co-products use among beef and dairy producers. The main objective was to inventory resources that currently offer challenges and opportunities for the utilization of bio-fuel by-products by small and medium-sized beef and dairy producers. The survey was distributed at 10 of the Regional Beef meetings during the winter of 2006–2007 and at 5 of the Regional Dairy meetings during the spring of 2007 organized by Purdue University Extension. Participants represented 414 different operations. The instrument contained 22 questions related to demographic characteristics, resources available, average production characterization, production goals, management practices, soil quality and environmental concerns. Some of the most evident limitations identified by the survey participants were size of the operation, storage facilities and equipment required. An additional analysis of the 13 ethanol plants across Indiana and the location of the participants operation were performed to identify possible links between the availability of distiller's grains and the willingness use these as alternative feeds. The survey results indicated that the majority of the participants, 75% of the beef and 84% of the dairy operations, have considered using bio-fuel co-products as a source for livestock feed. This data suggests that there is an opportunity for the use of co-products to lower feed cost and improve profitability in the beef and dairy industries if viable methods were implemented for small and medium-sized producers to utilize ethanol co-products.

Key Words: cattle producers, ethanol co-products, feed alternatives

W94 Farm animal welfare: Assessing public concern and attitudes. D. R. Deemer[1], J. A. Pempek*[1], L. M. Lobao[1], G. J. Coleman[2], and M. L. Eastridge[1], [1]*The Ohio State University*, *Columbus,* [2]*Monash University*, *Clayton, Victoria, Australia*.

Farm animal welfare has long concerned animal scientists, social scientists, and the food animal industry. However, relatively little is known about the US population's recent views regarding farm animal welfare. Much of our knowledge is based on case-studies or other research with limited generalized inferences. Among the questions consistently raised by analysts is the relationship between the public's knowledge of farm animals and their attitudes and food consumption behavior. Our research addresses the gap in the literature by examining the public's knowledge of farm animals, as well as other key covariates and their relationship to attitudes and food consumption behavior. Data are from a large, random sample of the Ohio population (N=1,000) and a comparative smaller nationwide sample taken during 2007. Along with variables measuring knowledge about farm animal production, we evaluated the relevance of key demographic variables, such as rural-urban residence, gender, income, and ethnicity. Multiple regression models using different dependent variables of animal welfare attitudes and behavior were employed. These models explained about 20% of the variance in attitudes, similar to studies of general attitudes. Across these models, the most consistent correlates of greater concern with farm animal welfare were gender (women) and urban residence, with standardized betas values ranging from (−0.130 to −0.207) for gender and from (−0.003 to −0.146 for urban residence). Based on these and other control variables of income and ethnicity, knowledge of farm animal production had little impact on attitudes and behavior. These results suggest that educational outreach to improve knowledge of farm animal production may have limited impact on attitudes and behavior relating to farm animal welfare.

Key Words: farm animal welfare, attitudes, behaviors

W95 Reproductive indicators in dairy cattle enterprises with different technological level. A. Pacheco Cervantes, D. V. Mariscal Aguayo*, H. Estrella Quintero, M. Huerta Bravo, R. Rangel Santos, and R. Núñez Domínguez, *Universidad Autónoma Chapingo*, *Jalisco, México*.

The objective of the study was to assess the reproductive behavior of family dairy enterprises that used Chapingo-Agropec Star, the technological development model for advice and consulting. The farms were stratified in 2 technological levels, transition and business, based on the following components: education, bovine equivalent, equivalent irrigation area, and production technology. The information used for the study was obtained from the general report generated by Agropec Star software which was captured by advisors of the farms. The database was made up of 17 enterprises with a total of 2,041 Holstein cows from 1996 to 2008. Age at first parturition (EPP), interval from calving to first estrus (IPC), interval from calving to first service (IPS), services per conception (SPC), days open (DA), and calving interval (IEP) were the evaluated variables. Effects in the statistical model included technological level (NT), number (NP), year (AP), and season (EP) of calving, and significant interactions ($P < 0.05$). The technological level affected ($P < 0.05$) IPS and IPC. Furthermore, the technological level interaction by year of calving not only affected these 2 variables (IPC and IPS) but also influenced EPP. Intervals at first estrous and first service interval presented at the technological business level (63.8 ± 6.2, 75.7 ± 5.5) were lower than the transitional technological level (90.8 ± 2.7, 91.1 ± 2.3). No significant differences ($P > 0.05$) were found for DA; however there was a tendency ($P > 0.08$) for an improvement in the reproductive behavior of the family business system.

Key Words: farms, Holstein, stratification

W96 Case study: Characterization of lying behavior in dairy cows transitioning from a freestall barn to a compost bedded pack barn. C. Gravatte*, C. Coombs, and J. Bewley, *University of Kentucky*, *Lexington*.

Cows devoid of ample lying time exhibit both physiological and behavioral signs of stress. Some dairy producers have begun using a new housing system, called a compost bedded pack barn. The key component of a compost bedded pack barn is an open resting area generally bedded with sawdust, dry fine wood shavings, or other organic materials. Compared with freestalls, cows have more room for movement and are able to lie down in a more natural manner. Our hypothesis states lying times would increase in a herd transitioning from a freestall barn to a compost bedded pack barn. The lying times of 11 lactating Holstein-Friesian cows were measured using an activity monitor in a commercial dairy herd. Cows were divided among 3 milk production categories (high, medium, and low). An IceTag animal activity monitoring sensor (IceRobotics Ltd., Edinburgh, Scotland, UK), which measures posture (lying versus standing) and steps, was attached to a hind leg of each cow above the fetlock. The MIXED procedure of SAS was used to fit a model describing the differences in hours lying between the 2 housing systems. Because of a delay in barn construction, more days were recorded (n = 872) for the freestall barn than the compost bedded pack barn (n = 212). LSMeans for hours lying were 9.7 ± 0.4 h/d and 13.5 ± 0.5 h/d for cows housed in the freestall barn and compost bedded pack barns, respectively ($P < 0.0001$). Older cows (Parity 2) spent significantly more ($P < 0.01$) time lying (12.7 0.6 h/d) than younger cows (parity 1) cows (10.5 0.4 h/d). Additionally, lying times were significantly shorter for cows with a locomotion score of 3 (10.5 0.5 h/d) than for cows with a locomotion score of 1 (12.2 0.7 h/d, $P < 0.05$) or 2 (12.2 0.0.7 h/d, $P < 0.05$). Although other factors may have affected lying behavior as the cows progressed through lactation and environmental conditions varied, lying times were significantly longer after the cows were housed in the compost barn. These results are representative of one dairy operation, though the significant increase in lying time demonstrates a need for further research.

Key Words: precision dairy farming, compost bedded pack barn, lying time

W97 Composting school: An educational tool to bring together dairy producers and other community members. M. E. de Haro Martí*[1] and J. A. Robbins[2], [1]*University of Idaho*, *Gooding*, [2]*University of Idaho*, *Jerome*.

Composting organic waste is an environmentally sound technique used around the world. Several studies have demonstrated the benefits of compost as soil amendment, sustainable waste treatment, and sound agricultural practice. In fall 2008 a unique "Composting School" program was held at the Gooding County Extension Office in response to stakeholder's questions and to teach them composting techniques and use. The program included 2 sessions that were conducted at the Gooding County Extension Office in late summer and early fall 2008. Two novelties made this program different from others offered in Idaho. First, the targeted audience was very heterogeneous including dairy producers, home owners, small farmers, and owners of horses, llamas, hogs, and sheep. The second idea included a hands-on section addressing composting techniques. After receiving theoretical training about composting, participants had the opportunity to build different systems for on-farm, home, and worm composting on site. During the second session, participants received a deeper overview of on-farm composting including mortality composting and compost use. Participants continued with the hands-on section by turning the piles and analyzing the performance of the different composting techniques built during the first session. The performance analysis detected a significant difference ($P < 0.01$) in temperature between the on-farm composting techniques and the home techniques. None of the 6 home composting units reached temperatures required by the Processes to Further Reduce Pathogens (PFRP). All 3 on-farm composting units reached PFRP. Forty-two participants attended the program. The program evaluations demonstrated that 50% of the respondents learned "a great deal," and 88% indicated they would adopt 2 or more techniques not used before attending the school. A permanent composting facility display remains at the Gooding Extension Office and is used with new programs.

Key Words: composting, waste management, extension