

by LL, and longer lactations (>16 days) showed higher FR ( $P<0.001$ ), and was seriously affected by lactations shortest than 7 days (60.3 vs 72.5% in L1 and L2;  $P<0.001$ ). Based on the FR equation described, the optimal LL was 25.4 d. On the other hand, TB and BA in the subsequent farrowing increased linearly with LL ( $P<0.001$ ). However, prolonging lactation decreases number of weaned piglets/sow/year. In this case, from the LL and WCI data, the calculated number of

litters/sow/year decreased from 2.39 in L4 to 2.26 in L5 group. We conclude that increasing LL improves productive and reproductive parameters. From these results we conclude that the best interval of LL is 24-32 d with an optimum of 25 d, offering an optimum balance among the main performance indicators.

**Key Words:** Lactation length, Performance, Sow

## Production, Management and the Environment IV

**475 Potential demand for dairy farm revenue insurance.** C. A. Wolf\*, J. C. Hadrich, and J. R. Black, *Michigan State University, East Lansing.*

Lowering the dairy price support throughout the 1980's led to a market milk price that has been largely determined by market forces since the early 1990's. Consequently the base farm market milk price has varied much more than it had in the decades where the price support intervened. In 2000 the Federal Crop Insurance Corporation authorized the Agricultural Risk Protection Act of 2000 to facilitate the provision of insurance on livestock, expanding insurance possibilities on farms to livestock enterprises. Adjusted Gross Revenue insurance is an insurance contract using expected accrual gross revenue as basis for determining the insurance guarantee. This paper examines the magnitude and causes revenue risk on dairy farms with the resulting implications for dairy farm revenue insurance demand. The empirical component of the analysis is based upon Michigan dairy farm panel data from 1990 through 2004. The average coefficient of variation for annual milk price across farms and over years was 11 percent with a standard deviation of 2 percent. This indicates that, while market price varied substantially, the institutions and policies in place to market milk heavily insulated farms from price variation on an annual basis. The crops for which current crop revenue insurance contracts are facilitated have coefficients of variation in the 18 to 22 percent range, much greater than for dairy. Milk yield per cow is also much less variable than yield in field crops, ranging from 5 to 9 percent; that compares to 25 to 40 percent for dryland crops. Kernel densities of de-trended milk per cow (milk yield) indicate that 92% of all farms were within 3,000 pounds/cow of trend yield (and 84% were within 2,000 pounds). With an average yield of 20,040 pounds/cow, the vast majority of farms were within 10 percent of trend yield. The resultant variability in milk revenue per cow is much less than that of crops, even irrigated crops. Dairy farm revenue shortfalls would seldom trigger an indemnity under the insurance policies evaluated. Potential sources of increasing risk and alternative risk management tools are considered.

**Key Words:** Insurance, Risk management

**476 Effect of mastitis and postpartum metabolic diseases on milk yield persistency in Holstein and Jersey cows.** J. A. D. R. N Appuhamy\*<sup>1</sup>, B. G. Cassell<sup>1</sup>, and J. B Cole<sup>2</sup>, <sup>1</sup>*Virginia Polytechnic Institute and State University, Blacksburg*, <sup>2</sup>*Animal Improvement Programs Laboratory, Agricultural Research Service, USDA, Beltsville, MD.*

The objective of this study was to investigate the effects of mastitis (MST) and postpartum metabolic diseases (PPMD) on persistency

of milk yield (P) in Holstein (H) and Jersey (J) cows. Data consisted of daily milk yields and health events for 59 H and 27 J cows calved between July, 2004 and March, 2005 in the Virginia Tech herd (Blacksburg, VA). Persistency was calculated as a function of a standard lactation curve and the linear regression of a cow's test day deviations on days in milk (DIM) and standardized. Values of  $P > 0$  indicate greater persistency. Standard curves were calculated from the data and did not account for breed differences. 10 test day yields before 128 DIM and 10 after were used to compute P for each cow; test day DIM were the same for all cows. Milk fever and ketosis were pooled into PPMD, and two MST classes were defined: occurrences before (MST1) and after (MST2) 128 DIM. Each disease was defined as a binary trait distinguishing between cows with at least one reported case (1) and cows with no cases (0). The statistical model included fixed effects of breed and parity with two binary variables indicating the presence (1) or absence (0) of the disease of primary interest or any other disease. Frequencies of cows with MST1, MST2 and PPMD were 24.5%, 25.6% and 10.5% respectively. The effect of MST1 on P was significant and had a phenotypic correlation of -0.20 with P. Thus, cows with mastitis in the first 128 d of lactation tended to be less persistent than cows with no mastitis. The correlations of MST2 and PPMD with P were -0.04 and 0.14, respectively and were not significant. Breed effects were highly significant, suggesting that H and J have differently-shaped lactation curves. Parity effects were not significant, as expected, because different standard curves were used for first and later parities.

**Key Words:** Mastitis, Metabolic diseases, Milk yield persistency

**477 Effect of preparturient intramuscular injection of vitamin E and selenium on milk somatic cell counts in Holstein cows.** Y. K. Fan\*<sup>1</sup>, I. T. Lin<sup>1,2</sup>, and H. I. Chang<sup>1,3</sup>, <sup>1</sup>*National Chung Hsing University, Taichung, Taiwan, ROC*, <sup>2</sup>*National Taiwan University, Taipei, Taiwan, ROC*, <sup>3</sup>*Uni-President Enterprises Corp., Tainan, Taiwan, ROC.*

Blood concentrations of D- $\alpha$ -tocopherol (vitE), selenium (Se), and glutathione peroxidase (GSHpx) activity decrease along with immune ability declines and incidence of mastitis increases during periparturient stage in dairy cows. It is supposed that application of vitE and Se on dairy cows is capable to prevent the animals from mastitis through promoting their antioxidation ability. This experiment investigated the effects of a high dose vitE and Se injection intramuscularly on the blood concentrations of vitE, Se and GSHpx activity, and milk somatic cell counts (SCC) at wk 2 and 4 postpartum in Holstein cows. Ten of 13 multiparity cows (535 $\pm$ 50.6 kg) were randomly allotted into two treatments, e.g., intramuscular injection with 4.4 g Tween 80 (Tw) or with 3,000 IU vitE plus 50 mg Na<sub>2</sub>SeO<sub>3</sub> dissolved in 4.4 g Tw (ESe)

once per head at both 2 weeks and 1 week prior to calving leaving 3 cows without injection regarded as controls (CNTRL). Blood plasma concentrations of vitE in ESe were 86% higher at one day after injection and declined in less extent at parturition ( $P < 0.05$ ). The correlation coefficient was 0.79 ( $P < 0.01$ ) between milk and plasma concentrations of vitE. There were no significant differences among the treatments in Se concentrations of blood serum and milk, GSHpx activity in whole blood, and SCC at week 2 postpartum. The incidences of clinical mastitis among the treatments were not significantly different. The incidence of retained placenta was 60% in ESe, which might be attributable to the consequence of the lowest Mg level in the blood serum. The correlation between milk and blood serum Fe concentrations, or the correlations among lactoferrin, transferrin, and SCC were not significant. In conclusion, intramuscular injection of vitE and Se to preparturient cows does prevent abruptly drop of blood plasma vitE level at parturition. However, the efficacies of lowering SCC and enhancing mammary gland health status by preparturient intramuscular injection with vitE and Se stay unclear in Holstein cows.

**Key Words:** Vitamin E, Selenium, Somatic cell count

**478 Management risk factors associated with clinical lameness in free stall housed Holstein cows.** L. A. Espejo and M. I. Endres\*, *University of Minnesota, St. Paul.*

The objective of this study was to investigate the association of some management factors with the prevalence of clinical lameness in 53 high production groups of Holstein cows housed in 50 commercial dairy farms with free stall barns in Minnesota. Cows in the high production group (total of 5626 cows) were scored for locomotion (LS; scale of 1 to 5, where 1 = normal and 5 = severely lame) in order to estimate the prevalence of clinical lameness in the group. A cow was considered clinically lame if her LS  $\geq 3$ . Prevalence of lameness averaged 24.6% across dairy farms. Management variables were used to explain the variation in the prevalence between groups. Among the variables tested, number of cows in the herd, pen square footage per cow, parlor type, parlor size, TMR crude protein content, TMR NDF content, feeding frequency and use of footbath did not show an association with the prevalence of lameness ( $P > 0.3$ ) in the univariate analysis screening test and they were not included in the multivariate model. Pen stocking rate (cows per stall), total daily distance between pen and parlor, number of cows per full time employee equivalent, rumination index and barn type (2-row or 3-row) were eliminated from the multivariate model with a stepwise procedure ( $P > 0.05$ ). The final model used to explain the variation in the prevalence of lameness between groups included time away from the pen during milking, cow comfort quotient, frequency of hoof trimming, brisket board height, area behind brisket board filled with concrete, and interaction between brisket board height and area behind brisket board filled with concrete. Time away from pen was positively associated with the prevalence of lameness ( $P < 0.01$ ), whereas cow comfort index was negatively associated with the prevalence of lameness ( $P < 0.01$ ). The prevalence of lameness was higher when farms performed hoof trimming only when was needed and not on a scheduled basis ( $P < 0.05$ ). Height of brisket board had a positive association with the prevalence of lameness ( $P < 0.01$ ) and there was an additive association when the area behind the brisket board was filled with concrete ( $P < 0.05$ ).

**Key Words:** Lameness, Free stall, Risk factor

**479 Using heat stress audits to evaluate the level of heat stress on commercial dairies.** J. Smith<sup>\*1</sup>, M. VanBaale<sup>2</sup>, R. Rodriguez<sup>3</sup>, C. Jamison<sup>3</sup>, M. Brouk<sup>1</sup>, and J. Harner III<sup>1</sup>, <sup>1</sup>*Kansas State University, Manhattan*, <sup>2</sup>*University of Arizona, Tucson*, <sup>3</sup>*Monsanto, St. Louis, MO.*

A project to evaluate the level of heat stress on individual dairies was conducted during the summer of 2005. The object of this project was to develop a method to evaluate or audit how effective an individual dairy is managing heat stress. Approximately 45 herds in 24 different states were audited to determine the level of heat stress cows experienced during a 72 h period. Dairies were selected based on geography, climate and facility design. Lactating cows 40 to 100 DIM and dry cows within 30 days of calving were evaluated. Vaginal temperatures of 8 cows located in the same group were collected every 5 min using data loggers (HOBO U12)<sup>®</sup> attached to a blank CIDR<sup>®</sup>. Ambient climatic data was collected throughout the project on dairies from utilizing logging devices which collected temperature and relative humidity at 5 minute intervals. Census data was collected at each dairy and included pen sizes, milking frequency, milking times, average milk production, DIM, parity, holding pen design, and timing of cow movements. Data were imported into Excel<sup>®</sup> as individual cow files aligned by time. The individual cow was then averaged with all other cows in the pen in hourly increments over a 24 hour period. Each 24 hour period was a summary of that hour on 3 consecutive days, with eight devices contributing 12 points per hour per day to the summary. So each hour is a summary of 12 data points x 8 cows x 3 days or 288 data points/hour. Information was summarized graphically in PowerPoint<sup>®</sup> and presented to the individual producers along with recommendations on how to improve their heat stress abatement practices. The project was not designed as a controlled trial; therefore caution is advised in over-interpreting the data. However, the project does demonstrate the feasibility and usefulness of using intra-vaginal temperature recording to monitor how well an individual dairy is managing heat stress.

**Key Words:** Heat stress, Cow comfort, Dairy facilities

**480 Evaluation of Advanced Dairy Systems shade tracker fans and Korral Kool coolers on lactating dairy cattle.** R Burgos\*, L. J. Odens, R. J. Collier, L. H. Baumgard, and M. J. VanBaale, *University of Arizona, Tucson.*

Two independent trials were conducted during the summer months of June 3rd to September 30th of 2004 and 2005. In each trial 400, multiparous and 100 primiparous Holstein cows balanced for parity, stage of lactation, and milk yield were randomly assigned to 1 of 2 cooling treatments (trts). Individual milk yields and pen DMI were collected daily, respiration rates (RR) and body surface temperatures (ST) were recorded weekly, and milk components, BCS and body weights (BW) were obtained monthly. In 2004, average daily milk production did not differ for multiparous cows housed in ADS-ST or KK (41.8 kg/d) pens. However, daily milk yield for primiparous cows housed under KK conditions tended ( $P = 0.10$ ) to be higher than cows housed under ADS-ST conditions (37.8 vs. 36.7 kg/d). Multiparous cows cooled with ADS-ST had a higher RR (60.5 vs. 58.3 BPM); however, RR in primiparous cows did not differ between treatments (59.2  $\pm$  0.8 BPM). In 2005, daily milk production for multiparous (42.2 vs. 38.3 kg/d) and primiparous (35.2 vs. 32.7 kg/d) cows housed in KK were higher ( $P < 0.05$ ) compared to cows housed under ADS-ST pens. Body weight change was similar in 2004 between multiparous cows housed in KK or ADS-ST trts (-0.49 vs. 13.3 kg/d), however

primiparous cows housed under KK conditions gained more BW (60.5 vs. 19.9 kg) than heifers housed under ADS-ST. Multiparous (70.9 vs. 59.3 BPM) and primiparous (72.2 vs. 61.3 BPM) cows cooled with ADS-ST had a higher RR. During times of moderate to severe heat stress cows housed under KK cooler out performed those cows housed under ADS-ST fans. During both trials, ADS-ST cooling system used less electricity (526 vs. 723; 2004 and 517 vs. 840; 2005 kwh/d) and water (291 vs. 305 and 290 vs. 460 L/d) than the KK coolers. The daily costs for the ADS-ST and KK system was \$27.30 and the KK system was \$36.36/d in 2004 and 25.95 vs. \$42.06 during the 2005 trial.

**Key Words:** Dairy cattle, Evaporative cooling, Heat stress

**481 Comparison of a 2-stage and linear controls for feedline soaking systems utilized in 2-row freestall barns.** M. J. Brouk\*, B. Cvetkovic, J. F. Smith, and J. P. Harner, *Kansas State University, Manhattan*.

Sixteen lactating Holstein cows were housed in four identical, 108 cow, 2-row freestall barns (four per barn) and utilized in a replicated double-switchback design to evaluate a 2-stage and linearly increasing feedline soaking system controller (C-440S, Edstrom Industries). Gradually increasing soaking frequency as temperature increases, could reduce heat stress as compared to a 2-stage control system. Initial barn minimal operation temperature for both treatments was set at 23.9 °C, with a soaking cycle every 15 min. The 2-stage treatment increased soaking frequency to once every 5 min when the barn temperature exceeded 29.4°C. The linear setting did not reach this frequency until the temperature exceeded 35°. All barns were equipped with supplemental cooling fans that operated when the barn temperature exceeded 21.1 °C. The study was completed during a period of summer heat stress and each experimental period contained 24 hr. Cattle were fitted with vaginal temperature probes that recorded vaginal temperature every minute. Visual respiration rates were recorded in the afternoon and early morning. Prior to statistical analysis, individual cow data were averaged by barn and day. Vaginal temperature data was summarized in 5-min segments of time for each hour of the day. Both controller treatments were equally (P=0.7) effective as indicated by similar average body temperatures (38.9°). Body temperatures differed at various times of the day but were unaffected by treatment (P=0.9). Afternoon, morning and average respiration rates were also similar (P=0.36). Based on these data, both controller settings provided effective heat abatement for the barns tested. The linear increase program utilized 8% less water than the 2-stage setting. Utilizing this type of controller may reduce freshwater consumption on dairy farms. Results may be different with differing barn designs, environment and feedline soaker systems.

**Key Words:** Heat abatement, Cow cooling, Facilities

**482 Impact of feedline soaker minimum operation temperature upon respiration rate and body temperature of lactating dairy cows.** M. J. Brouk\*, B. Cvetkovic, J. F. Smith, and J. P. Harner, *Kansas State University, Manhattan*.

Feedline soaking systems are generally operated when barn temperature reaches a predetermined threshold temperature. While it is generally recognized that heat stress in dairy cattle is associated with a THI of 72, other reports indicate that heat stress may occur prior to reaching this level. A common recommendation has been to operate fans when barn temperature exceeds 21.1°C and feedline soakers are generally set

to operate when temperature exceeds 23.9°C. This study investigated four different threshold temperatures for a feedline soaking system in four 2-row freestall barns located in northeast KS. Each barn was identical in construction and housed 108 Holstein cows. Four animals were selected from each barn (16 total) and fitted with temperature probe that recorded vaginal temperature every minute. Respiration rates were visually observed and recorded in the afternoon and early morning. A Latin square design was utilized to evaluate four different minimum operation temperatures (18.3, 21.1, 23.9 and 26.7°C). Each feedline soaking system was controlled by an electronic controller (C-440S, Edstrom Industries) which linearly increased soaking frequency as temperature increased to 35°C. All controllers increased soaking frequency as barn temperature increased. Periods were 24-hr in length during summer heat stress and all treatments appeared in all pens. Data were averaged by treatment within period prior to statistical analysis. Body temperature as indicated by vaginal temperature did not vary (P>0.35) with minimal operation temperature (38.7, 38.8, 38.8 and 38.8 °C, respectively for each treatment). Respiration rates tended to be greater (P<0.10) for the 26.7°C treatment as compared to the 18.3°C treatment. These data indicate that when feedline soaking systems are controlled electronically and increase soaking frequency as barn temperature increases, threshold temperature may range from 18.3 to 26.7°C in 2-row freestall buildings. Results may differ with other barn design and control systems lacking linear functions with increasing barn temperature.

**Key Words:** Heat abatement, Cow cooling, Facilities

**483 Rearing system effects on growth, puberty and serum prolactin concentrations in dairy heifers derived from beef cattle recipients of in-vivo developed or in-vitro produced embryos.** J. A. Small\*<sup>1</sup>, B. Sawatzky<sup>2</sup>, A. D. Kennedy<sup>2</sup>, H. Engelhardt<sup>3</sup>, J. D. Ambrose<sup>4</sup>, and K. M. Wittenberg<sup>2</sup>, <sup>1</sup>*Agriculture and Agri-Food Canada, Research Centre, Brandon, MB, Canada*, <sup>2</sup>*University of Manitoba, Winnipeg, MB, Canada*, <sup>3</sup>*Brandon University, Brandon, MB, Canada*, <sup>4</sup>*Alberta Agriculture, Food and Rural Development, Edmonton, AB, Canada*.

Our objective was to determine the effects of different rearing systems on the development of dairy heifers (n=26) derived from either in-vivo developed (IVD; n=12) or in-vitro produced (IVP; n=14) embryos in beef cattle recipients. At birth (Mar 13-29, 2004), gestation length was 5 d longer (P<0.05), and body weight (BW) 4 kg greater (P=0.06) for IVP than IVD heifers. At age 2 mo. BW was similar (P>0.05) between IVP and IVD heifers and at this time 10 heifers (4 IVD and 6 IVP) were weaned and transferred to a dairy farm for conventional rearing (CR). The remaining cow/calf pairs were turned-out to pasture until Sep-weaning, and at this time, heifers were assigned to one of two outdoor beef rearing facilities with (EP) or without (NP) supplemental lighting to extend winter photoperiod to 16 hr/day. After age 6 mo., all heifers were fed a mixed ration formulated for 2.46 Mcal ME and 161 g protein/kg DM. Mean BW and wither height at age 6, 12 and 15 mo. (467, 462 and 463 ±13 kg and 133, 131 and 132 cm) did not differ (P>0.05) among groups; but were greater for CR than EP or NP at age 9 mo., respectively (P<0.05). Mean serum prolactin concentration at ages 8, 9, 10, 11 and 12 mo. tended (P=0.09) to be higher for CR and EP than NP (10.9, 7.0 and 2.9 ±2.3 ng/mL, respectively). Fixed-time first service was at age 15 mo. and return services were based on standing estrus. Mean BW and condition score at age 19 mo., were greater for CR than EP and similar to NP (541, 500, and 499±5 kg and, 2.9, 2.3 and 2.3 ±0.1, respectively), and age at predicted calving, based on service date and pregnancy diagnosis, tended (P<0.09) to be greater for CR than EP or NP, and greater for IVD than IVP (24.5, 23.3 and

24.3 ±0.4 mo., and 24.3 and 23.6±0.3 mo., respectively). Compared to CR, dairy heifer growth in a beef system was set-back slightly after weaning and turnout, but this was overcome with time, and

EP treatment increased serum prolactin and advanced predicted calving date.

**Key Words:** Puberty, Photoperiod, Dairy Heifers

## Ruminant Nutrition: Nitrogen Metabolism – Dairy

**484 Effects of duodenal infusion of graded amounts of threonine on lactational performances of dairy cows.** H. Rulquin\*<sup>1</sup> and P. M. Pisulewski<sup>2</sup>, <sup>1</sup>University and Research Unit on Milk Production, Saint Gilles, France, <sup>2</sup>Agricultural University, Cracow, Poland.

Threonine is one of the proposed limiting amino acids for dairy cow. However, its requirement is poorly documented. A 4x4 Latin square was realized to study effects of duodenal infusion of graded amounts of Thr (0, 7, 28, and 49 g/d) during 4 days in 4 duodenally cannulated Holstein cows. DM of the diet consisted of 69 % corn silage, 4.9 % grass hay, 14% pea, 1.1 % molasses, 1.0 % urea, 7.3 % maize starch, 0.2 % fat, and 2.9 % of minerals and vitamins supplement. Diet covered 100 and 75% of energy and protein requirements. Requirements of the remaining 9 essential amino acids were met by infusing into the duodenum 666 g/d of a mixture including, Lys, His, Arg, Val, Met, Ile, Leu, Phe, Tyr, Trp and Glu (72, 33, 7, 41, 32, 27, 63, 19, 40, 4, 295 g/d respectively). Supply of Thr provided 75, 100, 125, and 150% of the expected requirements for the 4 treatments respectively. Concentration of Thr digestible in the small intestine were 3.65, 4.02, 5.0, 6.0 % of PDIE (equivalent to MP) for the 4 treatments respectively. Milk yield, fat yield and true protein content were not significantly affected by infusions. True protein yield tended to decrease linearly up to - 8 percent. It is concluded that Thr is not a limiting amino acid for dairy cows but excess of Thr decrease feed intake.

**Table 1. Effects of Thr duodenal infusion on lactational performances**

	Thr, g/d					
	20.1	19.4	19.6	18.1	0.34	L(P<0.01)
DMI, kg/d	20.1	19.4	19.6	18.1	0.34	L(P<0.01)
Milk, kg/d	30.0	28.8	27.5	28.9	0.58	NS
Fat yield, g/d	1442	1510	1389	1492	94	NS
True protein yield, g/d	886	851	853	812	22	L(P<0.1)
Fat content, %	4.78	5.17	5.09	5.17	0.34	NS
True protein content, %	2.96	2.96	3.12	2.82	0.06	NS
True protein content, %	2.96	2.96	3.12	2.82	0.06	NS

L = Linear effect; NS= non significant

**Key Words:** Thr requirements, Dairy cows, Milk protein

**485 Effect of different forms of methionine on lactational performance of dairy cows.** H. Rulquin\*<sup>1</sup>, B. Graulet<sup>2</sup>, L. Delaby<sup>1</sup>, and J. C. Robert<sup>2</sup>, <sup>1</sup>University and Research Unit on Milk Production, Saint Gilles, France, <sup>2</sup>Centre of Studies and Research on Nutrition, Commentry, France.

The use of rumen-protected Met to correct diets of dairy cows is limited by the lack of an efficient product that could be incorporated into the concentrate. The main objective of this trial was to test at practical doses (around 10 g absorbable Met) the efficiency of two forms of pelletable Met hydroxy analogs, D,L-2-hydroxy-4-(methylthio)-butanoic acid (HMB) and the isopropyl ester of HMB

(HMBi) to provide Met to cows, especially for milk protein synthesis compared to a control and to SmartamineM<sup>TM</sup>. These treatments were tested according to a 4 x 4 Latin square in 16 Holstein cows. The mean DM composition of the diet was 71.6 % corn silage, 14.6 % energy concentrate, 3.1% soyabean meal, 7% formaldehyde-treated soyabean meal, 1 % urea, 1.3 % mineral and vitamin supplements, and 0.13 % of HMB or HMBi. Smartamine was supplied top dressed (17g/hd/day) Dry matter of the energy concentrate contained 21.8% ground barley, 21.1% ground wheat, 15% fine wheat bran, 37.5% dehydrated beet pulp, 1.7% beet molasses, 0.6% limestone, 1.1% sodium bicarbonate, and 1.1% salt. DMI, milk and fat yields were not affected by the treatments (20.5, 20.3, 20.7, 20.9 kg/d; 31.4, 31.8, 31.5, 32.0 kg/d, and 1291, 1337, 1300, 1312 g/d for control, HMB, HMBi, and Smartamine respectively). Milk true protein yield increased by 32 and 41 g/d and true protein content increased by 0.1 and 0.07 % (P < 0.05) for HMBi and Smartamine respectively (962, 980, 994, 1003 g/d and 3.09, 3.10, 3.19, 3.16 % for control, HMB, HMBi and Smartamine respectively). Plasma Met concentrations were increased by 110 and 65 % that of the control value (P < 0.05) after HMBi and Smartamine treatments, respectively (16.49, 14.81, 34.65, 27.18 µM for control, HMB, HMBi and Smartamine respectively). Conversely to HMB, the isopropyl ester of HMB (HMBi) appeared to be an efficient source of methionine for dairy cows. As Smartamine, it significantly increases the milk protein yield and circulating Met level while HMB has no effect. HMBi is a new rumen-protected form of Met that can be supplied to cows integrated into pellets and this is important for feed manufacturer industry.

**Key Words:** Rumen-protected Met, Dairy cows, Milk protein

**486 Effect of the isopropylester of the hydroxylated analogue of methionin (HMBi) on feed intake and performance of dairy cows in early lactation.** V. A. Hindle<sup>1</sup>, C. A. Kan<sup>1</sup>, J. C. Robert<sup>2</sup>, and A. M. van Vuuren\*<sup>1</sup>, <sup>1</sup>Animal Sciences Group of Wageningen UR, Lelystad, The Netherlands, <sup>2</sup>Adisseo France SAS, Commentry, France.

A performance trial involving 68 multiparous Holstein-Friesian dairy cows was carried out from parturition till 15 weeks post partum, to evaluate the efficacy of isopropylester of the hydroxylated analogue of methionin (HMBi). The cows were fed a TMR comprising grass silage, corn silage, grass straw and soybean meal and were randomly assigned to one of the two dietary treatments: concentrates containing HMBi (daily dose 29 g of HMBi per cow) or concentrates without HMBi; the latter designed to provide approximately 90% of methionin requirements. Cows entered the trial according to calving date. Feed intake, bodyweight and milk yield were recorded daily. Milk was sampled during three evening and three morning milkings weekly and analyzed for protein, fat and lactose. Statistical analyses were performed on the calculated weekly averages of week 3 to 15. In lactation weeks 3, 7, 11 and 15, extra milk samples were taken to determine MUN and true protein concentration, and blood samples were taken to determine urea. Data were obtained from 31 cows receiving HMBi and 34 cows receiving the control diet. Average