Wageningen Processing Centre. Comparisons were made in terms of 1) ruminally synthesized microbial protein, 2) truly absorbed protein in the small intestine, and 3) degraded protein balance, based on 46 samples. The results showed that the predicted values from the DVE/OEB system and the NRC-2001 model had significant correlations with. However, using the DVE/OEB system, the overall average microbial protein supply based on available energy was 10% lower and the truly absorbed protein in the small intestine was 8% lower than that predicted by the NRC-2001 model. The difference was also found in the prediction of the degraded protein balances, which was 16% higher than that estimated based on data from the NRC-2001 model. These differences are due to considerably different factors used in calculations in the two models, although both are based on similar principles. This indicates that a further refinement is needed for a modern protein evaluation and prediction system.

Key Words: NRC Dairy Model, DVE/OEB System, Protein Evaluation

W135   Nutritive value of processed field tick beans predicted by two dairy models (NRC and DVE/OEB). P. Yu*[1], B. J. Leury[2], and A. R. Egan[2], [1]*Department of Animal and Poultry Science, University of Saskatchewan, Saskatoon, Canada,* [2]*School of Agriculture and Food Systems, University of Melbourne, Australia.*

The objective of this study was to compare the Dutch DVE/OEB system and the NRC-2001 model in the prediction of supply of protein to dairy cows from processed field tick beans. Comparisons were made in terms of 1) ruminally synthesized microbial CP, 2) truly absorbed protein in the small intestine, and 3) degraded protein balance. The results showed that the predicted values from the DVE/OEB system and the NRC-2001 model had significant correlations with high R (> 0.90) values. However, using the DVE/OEB system, the overall average microbial protein supply based on available energy was 16% higher and the truly absorbed protein in the small intestine was 9% higher than that predicted by the NRC-2001 model. The difference was also found in the prediction of the degraded protein balances (DPB), which was 5% lower than that predicted based on data from the NRC-2001 model. These differences are due to considerably different factors used in calculations in the two models, although both are based on similar principles.

Key Words: NRC-2001 Model, DVE.OEB System, Field Tick Bean

Production, Management and the Environment: Nutrition and Environment

W136   Application of manure screening as an on farm a tool to evaluate the animal / diet interface. M.J. Jerred*[1], T. G. Brion[1], S. R. Burghardi[1], K. A. Ruppel[2], and M. A. Messman[1], [1]*Cargill Animal Nutrition, Elk River, MN,* [2]*Cargill Animal Nutrition, Albany, NY.*

Animal performance is dependant on digestion of ingredients in the daily ration allotted to the animal. To better understand ration digestion on farm we have constructed a three screen manure separating apparatus for visual appraisal of manure. Manure evaluation along with knowledge of nutrient and particle size of the diet fed can help diagnose lack of conformance to nutrition model predictions. Sizes of the three screens are: 0.57, 0.31, and 0.16cm in diameter. A representative sample of fresh manure from eight to twelve cows in a pen of cattle is collected and washed through the series screens. Fecal samples from 29 commercial dairy farms were evaluated with the manure screener. The top screen averaged 18% (SE 1.6) by volume fecal particles, the middle screen averaged 30% (SE 4.5) by volume fecal particles and the bottom screen averaged 52% (SE 4.6) by volume fecal particles. On the top screen whole cottonseed, fiber particles and kernels of grain were typically observed. The middle and bottom screens typically contained fiber particles and co-product ingredients. To further evaluate the manure screener 4 no forage diets were fed. The top screen averaged 55% (SE 4.1) by volume fecal particles, the middle screen averaged 18% (SE 3.6) by volume fecal particles and the bottom screen averaged 27% (SE 2.6) by volume fecal particles. A T test was used to compare volume of particles retained on screens between normal and no forage diets. Feces from the no forage diet contained more (P = 0.001) particles on the top screen, fewer on the middle (P = 0.052) and bottom (P <0.001) screens than diets that contained forage. Increased fecal particles in the top screen may have resulted from increased ruminal particle passage because of reduced ruminal mat formation when the no forage diet was fed. A tool to screen manure to evaluate passage of dietary ingredients can be an aid in determining the source of model non-conformance.

Key Words: Manure Evaluation, Digestion, Ration Evaluation

W137   Prediction of urine N excretion from creatinine and milk urea nitrogen in primiparous and mulitparous cows. S.A. Flis* and M.A. Wattiaux, *University of Wisconsin-Madison.*

Urinary nitrogen (UN) excretion is an integral part of predicting N usage by an animal and formulating a farm N management plan. The objective of this research was to compare two UN prediction methods to observed values. Foley catheters were used to collect total urine excretion for 3 days from 8 lactating cows (4 multiparous and 4 primiparous) in a split-plot Latin square. Cows were fed one of four diets ranging from 0 to 20% excess N based on NRC 2001. Cows were weighed twice each period. The first prediction method was according to Kauffman

and St-Pierre, UN (g/d) = 0.0259 x BW (kg) x MUN (mg/dL). The second method was based on UN concentration multiplied by the urine volume (l/d) predicted as (2.9 x BW (kg))/(creatinine concentration in the urine). Both an AM and a PM spot sample of urine were used in predicting urine volume in this method. Cow BW ranged from 435 - 724 kg. The UN and volume predicted from both methods were lower in the primiparous cows (P < 0.001), but there was no parity by prediction method interaction (P = 0.6), indicating that the method of prediction is the same for both parity. Although the observed urine volume averaged 26.5 l/d, the predicted values averaged 34.7 l/d, for the PM samples, but 28.7 l/d for the AM samples. The PM prediction value was different from both the AM and the observed urine volumes (P = 0.01). The prediction of UN based on the AM and PM samples was 226 and 278 g/d respectively; with the observed UN at 208 g/d. Again the PM prediction of UN was different (P = 0.01) from both the AM and the observed values. In this trial, parity did not affect MUN, and the prediction of UN from MUN was 188 g/d. This prediction differed from the urine sampling methods (P < 0.001), but was not different from the observed values. These results suggest that the prediction of UN should be done from MUN values or AM samples of urine, but not PM samples. Diurnal variation, sampling time relative to feeding or other factors may have contributed to the bias in estimating UN from PM urine samples. MUN values are easier to obtain suggesting that the use of MUN to predict UN is the best approach.

Key Words: MUN, Creatinine, Urine Nitrogen

W138   Identifying dairy farms facing challenges in P management. V. A. Ishler* and L. E. Lanyon, *Pennsylvania State University, University Park.*

Reducing dietary P levels with the goal of minimizing P accumulation on dairy farms has been widely emphasized. Although there is opportunity to improve rations, this tactic alone may not solve the nutrient-loading problem for the most challenging situations, nor will it indicate when P accumulation is a problem. Herds required to comply with P-based nutrient management for crop production in the future or those planning expansions should look closely at the amount of P in manure that is or will be in excess of the local crop utilization potential. Herd size, ration composition, and ingredient source information was collected from eleven diverse Pennsylvania herds along with records of milk production. Accumulating P was determined by subtracting milk P (exported from the farm) and the home-grown crop P from total diet P. Dietary P on all eleven farms was very close to animal requirements, averaging 0.40% P (DM basis) with a range from 0.38% to 0.44%. However, purchased P ranged from 37% to 88% of the total P fed. Accumulating P (g/cow/d) was linearly related to percent purchased P, but was not related to diet P concentration. Farms with potential problems could be readily identified by this purchased P relationship. The ration P levels on farms with potential P problems were close to animal P requirements and not

different from the average. In this case, aggressively pursuing drastic ration changes to reduce dietary P concentration would have little impact on the accumulating P. The most appropriate tactic(s) for these farms may be beyond dietary changes and may rely on other whole farm strategies.

No. of farms	Accumulating P g/cow/day	Dietary P % DM basis	Purchased P %
1	0.0	0.40	37
1	4.5	0.41	40
1	9.1	0.41	46
4[1]	13.6	0.38-0.44	45-56
1[2]	18.1	0.38-0.40	56-58
1	31.8	0.40	72
1	40.8	0.42	73
1[2]	49.9	0.41-0.42	88

[1]Range of values for multiple farms.
[2]Herds with more than one lactating cow group.

Key Words: Phosphorus, Dairy, Manure

W139   The effect of TASCO meal, on body temperature, respiration rate, horn flies, hair score and calf immunoglobulin levels in beef cows. R. R. Evans*, J. E. Huston, and T. F. Best, *Mississippi State University, Prairie, MS.*

Previous work with TASCO seaweed meal (Ascophyllum nodosum), fed at the 10% level in a mineral to cows grazing Ky-31 fescue (Festuca arundinacea) infected with the endophyte Neotyphodium coenophialum, reduced rectal body temperatures (RBT) for cows and calves and cow respiration rate (CRR) and horn flies (HF). This trial was undertaken to determine if increasing the rate from 10% to 20% would further influence the effects measured in the initial trials. In January of 2002 and 2003, 45 days prior to calving, multiparous and primiparous cows were equally allotted by age, breed and weight into groups and fed minerals that included 0, 10 and 20% TASCO. Cows were fed infected fescue hay prior to grass putout and grazed infected fescue/mixed warm season perennial pastures. All values reported hereafter will be for inclusion rates of 0, 10 and 20%, respectively. Mineral consumption monitored weekly was not different (P< 0.05), 111.16; 111.72; and 111.44 g/h/d, with a targeted 112 g/h/d consumption. At birth calves were processed, a 5-ml blood sample drawn and serum collected to determine IgG levels utilizing a Single Radial Immunodifusion Kit (VMRD, Inc). Samples were compared to a standard, 1=low to 4= high reactivity. Pooled IgG levels for 2002 and 2003 were not different (P <0.05) at 3.320; 3.152; and 3.336. RBT recorded in July of 2002 were 40.25; 40.36; and 40.17 and for 2003, 38.99; 39.46; and 39.34 C, but were not different (P< 0.05). Mean RBT across groups was one degree less for 2003 than for 2002, reflective of cooler temperatures and higher rainfall in 2003. Calf weaning weights were not different (P <0.05) between treatment groups for 2002 (232.90; 222.90; 229.33 kg) and 2003 (242.47; 259.98; 244.89 kg), respectively. CRR were taken at 0800, 0110 and 1500 h for 10 days in August and September were not different (P < 0.05) between treatments in either year. HF were not different (P < 0.05) between treatments within year but were reduced in 2003 vs. 2002. Hair scores for cows was improved but were not different (P < 0.05) with the addition of TASCO at 10 and 20% but calf hair scores were not improved.

Key Words: TASCO, Seaweed, Fescue

W140   Efficacy of yeast ferment as urease inhibitor on controlling ammonia emission from manure slurry. S. Park*[1], S. Oh[2], and S. Kim[1], [1]*Division of Food Science, Korea University*, [2]*Department of Animal Science, Chonnam University, Korea.*

Urease (urea aminohydrase, EC 3.5.1.3) is a nickel-containing enzyme that hydrolyzes urea to form carbamate and ammonia; carbamate spontaneously degrades to CO2 and a second molecule of ammonia. Ammonia causes unpleasant odor and is harmful to animal and human health. The purpose of this study was to evaluate the potential of yeast culture isolated from yeast ferments as an urease inhibitor. About 200 yeast strains were isolated from yeast ferments. Yeasts were incubated with anaerobic and aerobic conditions. The urease inhibitory activities of yeast supernatants were measured by pH indicator assay. Ammonia

contents in manure slurry was measured at anaerobic and aerobic incubations using indophenol method (Berthelot reaction). Six yeast isolates were showed to inhibit urease a ratio about 25 45%. Yeasts supernatant were incubated in anaerobic condition at 25C showed the highest urease inhibitory activities. However yeasts supernatant were incubated in aerobic condition with shaking at 200 rpm/min showed lower urease inhibitory activities than other condition. AHA (acetohydroxymic acid) and NBPT (n-(n-butyl)thiophosphoric triamide) were known to effective urease inhibitors. However AHA is too expensive to utilize as an ammonia reducing material and NBPT is unable to use animal feed additives. These results demonstrated the potential of yeast culture as an urease inhibitor which is capable of reducing ammonia in animal farms.

Key Words: Urease, Inhibitor, Yeast

W141   Benefits of reducing the volume of cleaning wastewater on large dairy farms. J. K. Diehl* and W. J. Harper, *The Ohio State University, Columbus.*

As dairy farms continue to become larger and more regulated, manure management becomes an ever increasing topic of concern for the farmer. In areas where manure and other wastes are stored and applied to the land when conditions allow, farms are challenged by undersized storage structures and the cost associated with hauling waste. One step in reducing the volume of manure stored would be to reduce the volume of milking center wastewater entering the storage structure. In order to come up with water reduction solutions, the amount of cleaning wastewater used must be known. Literature values for cleaning wastewater volumes are highly variable and likely based on small farms. This study evaluated the amount of milking center wastewater generated and the farmers knowledge of wastewater volumes on large dairy farms in Ohio. Forty four replies were received from a mail survey of the 80 known farms milking more than 290 head. Ten of those responding were visited for an assessment of cleaning water usage. The farms surveyed ranged in size from 290 to 2100 milking cows with a mean of 515 cows. Knowledge of water usage varied by farm. 50% of farmers did not know the volume of water required to clean the pipelines, 71% did not know the volume used to clean the bulk tank, and 84% did not know the volume used to clean the parlor. On 86% of the farms, the wastewater produced by cleaning the bulk tank and pipelines was not reused. Most farmers (75%) indicated reducing the volume of water entering their manure storage structure would be a benefit to their operation. The farms visited ranged in size from 320 to 1850 milking cows with a mean of 596 cows. The total volume of milking center wastewater produced per day ranged from 360 to 4,800 gallons with a mean of 1,303 gallons/farm/day. These farms averaged 475,705 gallons of wastewater per year from cleaning the pipelines and bulk tanks alone. The amount of wastewater produced from the milking center was shown to be 2 to 10 times higher than values found in the literature. The actual volumes found justify exploration of practices to reduce or reuse cleaning water, thereby reducing the total volume of water entering manure storage structures.

Key Words: Dairy, Wastewater

W142   Composting organic wastes from a commercial slaughter house in Puerto Rico. R. Sanabria-León*, A. A. Rodríguez, and H. L. Santiago, *University of Puerto Rico Mayagüez Campus, Mayaguez, PR.*

The objective of this study was to evaluate the composting process as an alternative for the disposal of organic wastes from commercial slaughter houses (OWCS), using yard trimmings (YT) as bulking agent. Digestive tracts of small ruminants (OWCS) and YT were obtained from a commercial slaughter house and the Alzamora Laboratory Farm of the University of Puerto Rico at Mayagez, respectively. Three treatments were evaluated using 2:1 proportions (w/w): YT only (C); YT/OWCS in a single layer (YW), and YT/OWCS in double layers (YWW). Treatments were placed in composting bins of identical dimensions (3 cubic feet) and the moisture level adjusted to 60%. Temperatures were recorded daily to determine the time (d) needed by each treatment to reach the maximum temperature in each heat cycle. Composting characteristics such as: C:N ratio; OM and IM contents; and pH were measured at d 0, first and second heat cycles, and maturation of the composting process. The time needed to complete each cycle was also determined. Data was analyzed using a completely randomized design with a 3 (treatments) x 6 (composting phases) factorial arrangement of treatments. For the

entire composting process, pH was similar (P<0.05) regardless of treatments and phases. The N content increased and C:N ratio decreased (P<0.05) in all treatments during the entire composting process. In both heat cycles, thermophillic temperatures (>45°C) were reached in treatments containing OWSC. The C group was characterized by reaching mesophillic temperatures (25 to 45° C). At the beginning of the maturation phase, all OWCS were degraded; OM and the IM were higher (P<0.05) in YW and YWW, respectively, compared to the C group. These results suggest that composting could be an alternative for the disposal of organic wastes from slaughter houses. Further studies are needed in order to evaluate its use as an organic fertilizer.

Key Words: Composting, Organic Wastes, Slaughter Houses

W143   Effects of pit flushing frequency on farrowing house odor and gas concentrations. J. M. Schlipf*, M. Ellis, J. Ni, Y. Zhang, A. Mutlu, and T. L. Funk, *University of Illinois, Champaign-Urbana*.

This study was carried out over a 15-d period to determine the effect of pit flushing on gaseous emissions from a farrowing facility. A randomized block design was used with six rooms selected from a 14-room farrowing complex with five replicates over time. Two treatments were compared: control and flushed. Pits were flushed before the start of the study only for the control treatment and before the start and on d 8 of the study for flushed treatment. Samples were collected one day after sows were moved into the room, (d 1) and on d 8, 9, and 15. Samples were taken inside the room at the exhaust fan and outside at the pit fan exhaust. For odor analysis, air samples were pumped into 10 L Tedlar sampling bags and subsequently assessed by an 8-member olfactometry panel. Ammonia and hydrogen sulfide concentrations were measured using colorimetric detector tubes. Fan speed (taken at the same time as gas measurements) were not different (P > 0.05) between control and treated rooms. For the control rooms, concentrations of odor, NH_3, and H_2S in the exhaust air from room and pit fans increased from the start (d 1) to the end of the study (d 15); e.g., pit exhaust concentrations increased from 2.65 to 3.19 (SEM 0.071; P < 0.001) for odor units, from 1.27 to 2.75 (SEM 0.157; P < 0.001) for NH_3, and from 0.13 to 0.97 (SEM 0.067; P < 0.001) for H_2S. On d 8, odor and gas concentrations were numerically lower after flushing the pit than before from the room and pit exhausts, however, only the H_2S levels were different (P < 0.05).

Concentrations of H_2S 4 h before and 4 h after flushing were 0.54 and 0.10 ppm, (SEM 0.119) respectively, in the room exhaust, and 0.87 and 0.24 (SEM 0.125) ppm, respectively, in the fan exhaust. However, at the end (d 15) odor and gas levels were similar in the control and flushed rooms. Overall, results suggest that flushing the pits in this farrowing facility had a limited, short-term effect on odor, NH_3, and H_2S concentrations.

Key Words: Pigs, Odor, Gaseous Emissions

W144   Evaluation of round bale feeding sites on soil fecal bacteria and nutrient concentrations. N. A. Lenehan, J. M. DeRouchey*, T. T. Marston, M. L. Christian, and G. L. Marchin, *Kansas State University, Manhattan*.

An experiment was conducted over seven months (January to July, 2003) to evaluate fecal bacteria and nutrient concentrations in soil surrounding round bale feeders. Six-inch soil samples were taken monthly from 10 feeding sites at distances of 3, 12, 21, and 30 m from the feeder. Soil samples were taken prior (January) to livestock access to the sites, during (February, March, and April) the feeding period, and after (May, June, and July) cattle removal from the sites. Fecal *E. coli* concentrations reached their highest levels in April at distances of 3 and 12 m, and were greater (P<0.03) than all other months except March. At 21 and 30 m from the feeder, fecal *E. coli* concentrations were greater (P<0.01) in April than all other months. At a distance of 3 m from the feeding area, fecal *streptococci* concentrations were greater (P<0.01) in March and April compared to all other months. While fecal *E coli* concentrations in July had returned to levels similar to that in January, fecal *streptococci* remained at higher levels (P<0.05). For soil nutrients tested, the greatest increase generally occurred at 3 m from the feeders, with little differences thereafter. The highest level of soil phosphorus at 3 m was recorded in April, and concentrations exceeded (P<0.02) those in January, February, and May. Soil dry matter had quadratic decreases (P<0.02) in March, April, and July, and linear decreases (P<0.01) in May and June as the distance from the feeding area decreased. Results indicate that the immediate area surrounding round bale feeding sites should be cleaned of manure, wasted feed, or bedding following cattle removal to reduce environmental impacts.

Key Words: Feeding Sites, Fecal Bacteria, Environment

Beef Species: Management and Beef Performance

W145   Evaluation of SafeGuard® (fenbendazole) oral drench in addition to Ivomec® (ivermectin) pour-on on performance and carcass merit of finishing heifers. C. D. Reinhardt*, J. P. Hutcheson, and W. T. Nichols, *Intervet, Inc, Millsboro, DE*.

One thousand one hundred six English×Continental crossbred heifers (340 kg) were used in a randomized complete block study. Treatments were: 1) SafeGuard® (5 mg/kg BW) and Ivomec® pour-on (500 mcg/kg BW) day 0 (SGPO), and 2) Ivomec pour-on (500 mcg/kg BW) day 0 (PO). There were 8 pens per treatment with an average of 69 head per pen. Heifers were fed for 135 days. Heifers treated with SGPO had 73% (P = 0.06) and 68% (P = 0.06) fewer eggs per 3 g fecal sample at d98 post-treatment and at the end of the feeding period than heifers treated with PO. Heifers treated with SGPO had higher dry matter intake, higher average daily gains, heavier final weight, and heavier carcass weights than heifers treated with PO alone (P < 0.05). Percentage of carcasses grading Prime+Choice was higher (P = 0.07) and marbling score tended to be higher (P = 0.13) for heifers treated with SGPO vs. heifers treated with PO alone. These data indicate that feed intake, daily gain, carcass weight, and carcass quality of feedlot heifers can be improved using fenbendazole in conjunction with ivermectin pour-on compared to using ivermectin pour-on alone due to improved parasite reduction of the combined treatment protocol.

Carcass-adjusted performance[1]

Trt	Egg ct[2]	ADG,kg	DMI,kg	G:F	HCW,kg	Pr+Ch,%
SGPO	3[a]	1.53[c]	8.12[c]	.190[c]	337[c]	47.9[a]
PO	12[b]	1.47[d]	7.93[d]	.187[d]	332[d]	42.6[b]

[1] HCW divided by .6193; [2] eggs/3g sample d98 post-trt
[a,b] differ (P<.10)[c,d] differ (P<.05)

Key Words: Fenbendazole, Feedlot, Parasites

W146   Examination of reproduction and weaning results in Limousin cattle population in Hungary. F. Szabo*[1], Z. Lengyel[1], S. Balika[2], I. Erdei[1], D. Marton[1], T. Major[1], and S. Bene[1], [1]*University of Veszprem Georgikon Faculty of Agriculture, Hungary*, [2]*Hungarian Limousin Association, Budapest, Hungary*.

Weaning performance, gestation length and calving difficulty of 2555 purebred calves (1305 male and 1250 female) born from 713 cows mated with 43 sires were analyzed in two farms. Heritability, repeatability, breeding value, genetic and environmental variance of weaning weight (VS), preweaning daily gain (SGY), 205-day weight (KVS), gestation length (VI), calving difficulty (EL) the genetic, phenotypic and environmental correlation between VS and SGY were calculated. The genotype-environment interaction was analysed with method of rank correlation. Farm, year of birth, season of birth, sex, number of calving as fixed, while sire as a random effect was treated. Data were analyzed with Harveys (1990) Least Square Maximum Likelihood Computer and SPSS 9.0. The overall mean value and standard error of VS, SGY, KVS, VI and EL were 208±5.29 kg, 997±24.50 g/day, 205±5.54 kg, 285±1.54 day and 0.97±0.03, respectively. The average age of the analysed calves was 211 days. The heritability of traits was between 0.10 and 0.44. The genetic, phenotypic and environmental correlation between VS and SGY was strong and positive. The rank correlation values were low in the case of the investigated traits (r = 0.05-0.27), therefore the order of sire rank were different in the two farms.

Key Words: Weaning Wt, Heritability, Correlation