many arid regions populations to make use of surplus camel milk with potentials for marketing such products.

Key Words: Camel Milk, Yogurt, Consumer Acceptance

W298 Physico-chemical and sensory properties of liquid-type yogurt with Lactobacillus casei 00692. B. J. Jeon*, J. S. Seok, and H. S. Kwak, *Sejong University, Seoul, Korea*.

This study was carried out to find the physico-chemical and sensory attributes of liquid-type yogurt with Lactobacillus casei 00692 during 72 hr fermentation at 37°. The pH decreased upto 32 hr and plauteaued thereafter, and the titratable acidity increased upto 40 hr. The growth of lactic acid bacteria sharply increased with 9.0 × 109 cfu/ml upto 36 hr of fermentation and slowly increased thereafter. The free amino acids produced during the fermentation reached the maximum value at 40 hr and gradually decreased thereafter. In the result of electrophoresis, the band was the thickest at 44 hr and mostly disappeared at 72 hr fermentation. In a sensory analysis, yogurt flavor was gradually developed during 30 hr, while bitterness score did not significantly changed throughout fermentation periods. The present data showed that the range of optimum fermentation time for liquid-type yogurt using Lactobacillus casei 00692 was from 40 to 44 hr.

Key Words: Fermentation Time, Liquid-Type Yogurt, Lactobacillus casei

International Animal Agriculture

W299 Utilization of *Leucaena leucocephala* as supplement for goats in the semi arid areas of Venezuela. T. Clavero* and R. Razz, *La Universidad del Zulia, Venezuela*.

A field experiment was conducted in the dry land farming area of northwest Venezuela in order to evaluate three diets in grazing goats (grazing pasture only (buffel grass); grazing pasture + 0.3 kg of commercial concentrate/animal/d; grazing pasture + restricted browsing for two hours daily *Leucaena leucocephala*) on milk production and milk composition. The experiment was laid out randomized block design. The data showed significant difference (P #88040.05) between treatments. Daily milk yield increased in 35 and 52.7% when goats had access to commercial concentrate or browsing Leucaena as well as grass pasture compared with the control treatment. Daily milk yield in goats with access to Leucaena was insignificantly different than goats on concentrate. Treatments did not affect milk composition. The results suggest that Leucaena can supply an adequate amount of nutrients with similar value to commercial concentrate for milk production without adverse effects on tropical grazing goats.

Key Words: Leucaena leucocephala, Goat, Milk Production

W300 Estimation of genetic and phenotypic parameters of total milk production in Suran Holstein dairy farm. S. Zakizadeh, A. Horufi*, and M. Qolipur, *High Education center of Jihad & Agriculture*.

Most traits of economic importance in animal breeding are quantitative in nature. The phenotypes observed are thus the combined results of the action of many genes or quantitative trait loci and environmental effects. As the selection of dairy cattle is focused on the improvement of yield and composition of milk, the object of this research was to estimate genetic parameters and breeding values of total milk production in a Holstein dairy farm in the northeast of Iran. The data used from Animal Breeding Center of Iran and consisted of total milk records from 2247 cows, between 1990 and 2003. Base population was imported from Canada and the Netherlands in 1990. To investigate environmental effects, following model was analyzed in JMP 3.1.2 Software. The model included random effects of sire and dam, lactation and calving year as fixed effects, calving interval, peak of yield, and days in milk as covariates. All factors were significant ($p<0.05$). It was concluded that the highest milk production would be achieved in the 4th lactation. Animal model procedure was used to estimate genetic parameters and breeding values by DF-REML software. Heritability and repeatability coefficients were 0.2 and 0.36 respectively.

Key Words: Total Milk Production, Genetic and Phenotypic Parameter Estimation, Milk Production Heritability

W301 Assessment of microbial colonization and kinetics degradation of Distichlis grass irrigated with fresh or brackish water in dromedary camels. G. Alhadrami*[1], A. El Awad[1], and M. Pessarakli[2], [1]*Department of Aridland Agriculture, College of Food Systems, United Arab Emirates University, Al-Muhandeseen - Giza,* [2]*Department of Plant Sciences, University of Arizona, Tucson*.

An in situ study was conducted to investigate the extent and kinetics degradation of DM, NDF, ADF and microbial colonization of *Distichlis spicata* grass (halophytic grass) irrigated with fresh water (DFW) or with brackish water (DBW) in the rumen environment of dromedary camels. Three camels fitted with rumen cannulas were used in this experiment. Camels were fed concentrate and Rhodes grass hay individually to maintain body weight constant and had free access to fresh water. Distichlis plants were labeled with ^{15}N as an internal marker. Amount of ^{15}N in excess of 0.366 atom% were considered as enrichment. Dilution of enrichment estimated percentage of microbial nitrogen. Labeled DFW and DBW grasses were weighed and placed in nylon bags and incubated in the rumen of the camels for up to 48 h. Differences in DM, NDF and ADF degradation were not significant between DFW and DBW, except at 48 hours the DM ($P\leq0.04$) and NDF ($P\leq0.027$) of DBW were significantly higher. Contamination expressed as percentage of microbial-N to total residual-N increased with incubation time and was less in DBW compared to DFW, differences were significant after 24 h ($P\leq 0.011$) and 48 h ($P\leq 0.001$) of incubation. Microbial colonization (expressed as percentage of microbial crude protein) and microbial cell mass followed the same trend. After 48 h of rumen incubation, microbial nitrogen was 30.3% in DBW and 42.6% in DFW. Microbial crude protein was 4.7% in DBW and 6.2% in DFW. In both DFW and DBW, microbial colonization and microbial contamination increased with incubation time. Microbial contamination affected estimates of in situ ruminal protein degradation of Distichlis grass irrigated with fresh water more than the Distichlis grass irrigated with brackish water.

Key Words: Distichlis Grass, Microbial Contamination, Dromedary Camels

W302 Effect of molasses on nutritional quality of *Pithecellobium dulce* silage. T. Clavero* and R. Razz, *La Universidad del Zulia, Venezuela*.

This study determined the influence of varying levels of molasses and ensiling time on the content of the nitrogenous fractions, chemical composition and fermentation quality during ensiling of *Pithecellobium dulce* in the farming systems of Venezuela. Chopped fresh plant materials of about 1 cm length were ensiled into laboratory silo ans stored at 25°C. Treatments were applied according to a 3x3 factorial arrangements in a completely randomized design. Factors studied were three rates of legumes:molasses, 1:8, 1:10, 1:12 (w/v) and three storage periods 1, 2 and 3 months. After opening the silos, dry matter (DM), pH, total nitrogen content (NT), rumen soluble nitrogen (SN), protein nitrogen (NP), nitrogen in acid detergent fiber (NADF), nitrogen fixed to the cell wall of the total nitrogen (NNDF/NT), in vitro DM digestibility (IVDMD), neutral detergent fiber (NDF) and acid detergent fiber (ADF) were determined. DM of *Pithecellobium dulce* was not changed during ensiling and the molasses additive had not significant effect on the silage DM. The mean pH values decreased significantly ($P\leq0.05$) with increased level of molasses and storage period, respectively. The lowest pH value (4.06) was obtained with the relation 1:12. No significant differences in NT, NP, NADF, NNDF/NT, pH, ADF and NDF were found between molasses treatments. Content of NS and digestibility increased significantly ($P\leq0.05$) with increased level of molasses. Except for NP and NS, the ensiling time significantly affected ($P\leq0.01$) the loss in digestibility, NT, NADF, NNDF/NT, pH, ADF and NDF. The greatest losses ocurred within 1-2 months of ensiling. The results showed that *Pithecellobium dulce* fodder can be preserved successfully by ensiling with molasses additive.

Key Words: *Pithecellobium dulce*, Silage Quality, Molasses

W303 Cow preference between conventional sand bedded free stalls and free stalls with sand savers. R. J. Norell*[1], P. C. Deaton[1], J. H. Packham[2], and S. C. Parkinson[3], [1]*University of Idaho, Idaho Falls,* [2]*University of Idaho, Paris,* [3]*University of Idaho, Preston.*

Sand is considered the gold standard bedding for free stalls but it can be expensive due to high sand utilization rates. Commercial sand saving devices have been developed to reduce sand utilization in free stalls. The objective of this study was to compare cow preference between conventional sand based free stalls and free stalls with sand savers on a commercial dairy operation with Holstein cows. The free stall facility had three rows of stalls. Each row had ten conventional sand stalls, ten with Agri-web (Presto Products, Appleton, WI) and ten with Sand Traps (Albers Inc., Jerome, ID). Free-stalls were 2.29m long and 1.22m wide. The neck rail was mounted on top of large loop cantilever stall dividers (1.13m above stall base) and located 1.73m from the back of the curb. Sand savers were positioned on top of tamped gravel and were installed 5cm below the top of the curb. Stalls were then filled with sand. The stocking rate was one cow per stall. Cows were milked 3x daily and had access to an outdoor dirt lot for 3h daily. Cow behavior was monitored for six-24 h periods with a digital camera system that saved images every 20 minutes. Data were analyzed as a randomized complete block design with replication. Sand saver stalls had more h of stall occupancy/day ($p<0.005$), more h of cow resting time ($p<0.003$), and a higher stall turnover rate ($p<0.01$) than control stalls. Occupancy, resting time, and stall turnover rate were numerically higher for Sand traps over Agri-web based stalls but differences were not significant ($p>0.10$). Standing in stall behavior did not differ between the three stall bed surfaces ($p>0.32$). Comfort index (h lying in stall divided by h occupy stall) averaged 90% and did not differ ($p>0.69$) between stall treatments. Bedding was a fine grain sand that tended to compact in the control stalls but not in the sand saver stalls. Sand utilization did not differ between treatments but sand saver stall were used more hours per day and had a higher turnover rate. Cows appear to prefer stalls with sand saver devices over conventional sand stalls.

Stall usage	Control	Sand Trap	Agir-web	SE
Occupancy	8.1	11.4	10.5	0.3
Resting	7.3	10.3	9.5	0.3
Comfort index %	89.5	90.4	90.3	0.7
Turnover rates (times/d)	6.2	8.2	7.6	0.3

Key Words: Free Stall, Preference, Sand Bedding