ammonia (28.5 vs 33.3 vs 39.5) as compared to sodium bicarbonate or buffer derived from calcified seaweed. Buffer derived from calcified seaweed increase ruminal pH values in steer fed a diet with 30% forage and 70% concentrate, but did not changed the ruminal disappearance of diet, volatile fatty acid or N ammonia.

Key Words: pH, Ruminal Disappearance, Ruminal Buffer

W256 Net energy and protein requirements for maintenance and gain of Nellore steers estimated with deuterium oxide[2]. G. Aferri*[1], P. R. Leme[1], A. S. C. Pereira[1], R. R. P. S. Corte[1], M. Z. Moreira[1], and D. P. D. Lanna[1], [1]*Universidade de São Paulo*, *Pirassununga, São Paulo, Brasil*, [2]*FAPESP*, *São Paulo, São Paulo, Brasil*.

Thirty six Nellore steers with a mean weight and age of 359 kg and 20 months at the beginning of the trial were individually fed to determine the energy and protein requirements for maintenance and gain. The steers were fed the same diet (76.43% TDN and 13.62% CP) in three levels of dry matter (DM) intake, *ad libitum*, 75 g DM/kg $LW^{0.75}$ and 60 g DM/kg $LW^{0.75}$. The body composition was estimated with the marker deuterium oxide that allowed repeated water estimate in the same animal. Deuterium in blood samples was analyzed by mass spectrography. The empty body weigh (EBW) from shrunk body weigh (SBW), was obtained from equation: EBW(kg) = -15.74911+(0.98517×SBW), (R^2=0.96, $S_{y.x}$=8.64). The following equations were used to estimate the empty body chemical composition: Water% = 65.9654+(0.0977×Deuterium Space)-(0.0909×SBW), (R^2=0.83, $S_{y.x}$=1.33), Fat% = 93.92968-(1.27598×Water%), (R^2=0.97, $S_{y.x}$=0.62). The relationships between protein and water and between ash and water in the empty body were 0.3009 and 0.0747, respectively. The net energy for maintenance (NEm) was calculated as the antilogarithm of the intercept of the linear regression of the logarithm of heat production on the metabolizable energy intake. The heat production of the steers was calculated by deducting energy retained from metabolizable energy intake. The net energy requirement for weight gain (NEg) was determined as the energy deposited in the gain. The net protein requirement for weight gain (NPg) was determined as the retained protein in the gain. The equations were calculated using the statistical program SAS. The NEm was 74 kcal/kg $EBW^{0.75}$ or 70 kcal/kg $LW^{0.75}$. The NEg for steers with 450 kg weight was 4.47 Mcal. The net protein maintenance requirement was 186 g/kg LW and NPg was 133 g/kg LW gain.

Key Words: Nutrition, Ruminant

W257 Venous blood gas in Holstein steers fed diets differing in concentrate to alfalfa hay ratios. M. Danesh Mesgaran*, A. R. Vakili, and A. Heravi Mousavi, *Ferdowsi University of Mashhad*, *Mashhad, Khorasan Razavi, Iran*.

The aim of the present experiment was to investigate the effect of diets providing different concentrate: lucerne hay ratios on venous blood gas in Holstein steers. Holstein steers (initial body weight= 261±15 kg, n=30) were adapted to experimental diets for one week. Then, for 120 days, steers were fed 10 kg of DM of diets differing in concentrate (155 g CP kg^{-1} of DM; 30% maize, 34% barley, 8% soybean meal, 5% sugar beet pulp, 10% wheat bran, 12% cottonseed meal, 0.3% CaCO3, 0.5% mineral and vitamin premix, 0.2% salt) to alfalfa hay ratios as 60:40 (C_{60}:A_{40}) and 80:20 (C_{80}:A_{20}) in a completely randomized design. Animals were fed the experimental diets (ad lib) as total mixed ration twice daily at 0800 and 2000 h. At days 60 and 120 of the experimental period, blood samples were taken from jugular vein 4 h after the morning feeding. Samples were analyzed for venous blood gas by Automatic blood gas system (AVL 995, Switzerland). Data were analyzed as repeat measures using the PROMIX of SAS and the means compared by the Duncan test (P< 0.05). The results of the present study indicated that blood HCO_3^- and $PaCO_2$ were not significantly affected by time when steers were fed high concentrate diets. However, HCO_3^- was significantly affected by time (p< 0.05). Therefore it was concluded that the increasing of concentrate from 60 to 80 % could not cause a mixed metabolic acidosis in our condition.

Table 1. Venous blood gas in steers fed diets differing in concentrate: alfalfa hay ratios

Item	Sampling				Treatment effect		Time effect	
	60 days	120 days						
	Concentrate: alfalfa hay ratio				SEM[1]	P[2]	SEM	P
	C_{60}: A_{40}	C_{80}: A_{20}	C_{60}: A_{40}	C_{80}: A_{20}				
pH	7.33	7.35	7.38	7.36	0.01	0.97	0.01	0.05
PO_2 (mmHg)	37.31	35.41	35.33	38.37	1.17	0.76	1.02	0.67
PCO_2 (mmHg)	56.95	57.28	55.85	65.80	2.63	0.19	2.35	0.22
HCO_3^- (mEq/lit)	29.61	30.80	31.50	35.24	1.23	0.19	1.1	0.03
O_2 Saturation (%)	62.34	60.67	60.23	64.16	1.84	0.74	1.46	0.05

1: SEM: Standard Error of Mean; 2: P: Probability

Key Words: Venous Blood Gas, Steer, Alfalfa Hay

W258 *In vitro* gas production kinetics of regional feedstuffs used in sheep diets in Northwest Mexico. A. S. Juarez-Reyes[1], G. Nevarez-Carrasco[1], M. A. Cerrillo-Soto*[1], J. F. Obregon[2], and F. G. Rios[2], [1]*FMVZ-Universidad Juarez del Estado de Durango*, *Durango, Durango, Mexico*, [2]*FMVZ-Universidad Autonoma de Sinaloa*, *Culiacan, Sinaloa, Mexico*.

Sheep production in Northwest Mexico represents an important potential. Agricultural products which are mainly produced for human consumption are also utilized for animal production. Thus, a study was carried out to determine the *in vitro* gas production (GP) characteristics of regional feedstuffs commonly used in sheep nutrition practices in the dry tropics of northwest Mexico. Samples (200 mg) of broom sorghum (BS), cull apple meal (CAM), cull raw chickpeas (CRC), cull cooked chickpeas (CCC), and cull cooked beans (CCB) were placed in 100 ml calibrated glass syringes by triplicate. Buffered and mineral solutions were mixed in a 2:1 proportion with rumen fluid collected from three rumen cannulated sheep fed alfalfa hay and a commercial concentrate (75:25). Thirty ml of buffered rumen fluid was dispensed to each syringe at the time incubation started. The gas volume was recorded at 0, 3, 6, 9, 12, 24, 48, 72 and 96h. Data obtained were fitted to the equation: p=a+b ($1-e^{-ct}$) using PROC NLIN. Metabolizable energy (ME) content from *in vitro* gas production was determined by: ME (Mcal kg^{-1} DM) = (2.20 + 0.136 GP_{24h} + 0.057 Crude Protein + 0.0029 Crude Fat^2)/4.184. Data were analyzed using ANOVA for a completely randomized design. Differences (P<0.05) were registered in the gas produced from the soluble (**a**) fraction of feeds. CRC registered the higher value while the lower was registered in BS. The higher (P<0.05) gas produced from the slowly