517 Rate of maturing and proportion of mature body weight at puberty of crossbred cows. H. C. Freetly* and L. A. Kuehn, *USDA, ARS, U.S. Meat Animal Research Center, Clay Center, NE.*

Cows born (1999 – 2000) resulting from AI breeding Hereford (n = 58), Angus (n = 61), Red Angus (n = 70), Simmental (n = 74), Limousin (n = 80), Charolais (n = 74), or Gelbvieh (n = 78) bulls to Angus (A; n = 69), Hereford (H; n = 173), or MARC III composite (M; n = 253) cows were weighed 6 times as calves and then twice a year as cows through 7 years of age. Body condition scores (BCS; 1 through 9 scale) and BW were collected at the beginning of breeding and then again in 4 mo. Cow BW was standardized to a BCS of 6 by allowing ± 45 kg BW/BCS different than 6. Individual growth curves of BW on age (wk) were fit with the nonlinear function $f(\text{age}) = A - Be^{kxage}$ using the Gauss-Newton iterations to minimize error sum-of-squares. Proportion of mature weight reached at puberty (n = 459) was solved for age at puberty with $f(\text{age}) = 1 - (B/A)e^{kxage}$. Sire and dam breed effects were tested with a model including sire breed (S), dam breed (D), birth year (Y), S x D, S x Y, and D x Y. Sire nested within S, was treated as a random effect. There was no S x D interaction for k ($P = 0.49$), B/A ($P = 0.21$), and maturity at puberty ($P = 0.61$). Main effects for S differed for k ($P = 0.01$), B/A ($P = 0.04$), and tended to differ for maturity at puberty ($P = 0.09$). Main effects for D differed for k ($P < 0.001$; H -0.01308 ± 0.00024, A -0.01426 ± 0.00015, M -0.01365 ± 0.00013), and for maturity at puberty ($P < 0.001$; H 0.523 ± 0.007, A 0.542 ± 0.004, M 0.523 ± 0.003), but not for B/A ($P = 0.88$). There were S x Y ($P = 0.005$), and D x Y ($P = 0.02$) interactions for k, and S x Y ($P = 0.006$), and D x Y ($P = 0.02$) interactions for B/A.

Table 1. Sire breed means and standard errors

Breed	k	B/A	Maturity at puberty
Hereford	-0.01244 ± 0.00034	0.9135 ± 0.0035	0.508 ± 0.011
Angus	-0.01382 ± 0.00029	0.9123 ± 0.0030	0.529 ± 0.007
Red Angus	-0.01397 ± 0.00030	0.9075 ± 0.0031	0.532 ± 0.008
Simmental	-0.01396 ± 0.00030	0.9099 ± 0.0031	0.532 ± 0.008
Limousin	-0.01362 ± 0.00027	0.9178 ± 0.0027	0.545 ± 0.007
Charolais	-0.01393 ± 0.00027	0.9200 ± 0.0027	0.538 ± 0.007
Gelbvieh	-0.01390 ± 0.00027	0.9132 ± 0.0028	0.521 ± 0.007

Key Words: cow, maturity, puberty

518 Breed comparison of post partum ovarian activity in cows. C. Disenhaus*[1], E. Cutullic[1], F. Blanc[2], and J. Agabriel[3], [1]*INRA UMR1080 Dairy Production, Rennes, France*, [2]*ENITAC, Lempdes, France*, [3]*INRA UR1213 Unité de recherches sur les herbivores, Saint-Genès-Champagnelle France.*

Recent references about postpartum ovarian activity are available only in Holstein cows. The aim of the study is to compare post partum (pp) ovarian activity in Charolaise (beef, CH), Normande (dual purpose, NO) and Holstein (dairy, H) cows. A data set including 367 progesterone profiles established between 2006 and 2008 was used (CH: N=125; NO: N=106; H: N=136). Twice a day, cows were or milked (NO and H) or suckled (CH). The onset of luteal activity (C-LA), length of normal estrous cycles and characterization of the pp activity were determined. Breed and parity effects were analyzed. The resumption of ovarian activity was slower in CH breed than in others (Table 1; P<0.01). At 50 days pp, more H than NO cows (P<0.05) were still inactive. In all breeds, C-LA 50d were lower for primiparous cows than for multiparous (CH: 50% vs.74%: P< 0.01; NO: 84% vs.100%; P<0.05; H: 70% vs. 84%; P<0.01). Once estrous cycles have been established, CH cows showed good further cyclic activity without any abnormal cycles. In agreement with the literature, the main cycle abnormality was prolonged luteal phase (PLP). 23% of H-cows showed PLP vs. 8% of NO cows (P<0.01). Duration of cycles seemed to be related to breed milk potential. Normal cycles were longer for H than for NO cows (22.6 ± 2.3 vs. 21.4 ± 2.1 days, N= 136 and 155; P<0.001) with a median value of 23 vs. 21 days. Cycles were shorter for CH than for NO cows (20.2 ± 2.2 vs. 21.4 ± 2.1days, N=77 and 155; P<0.05) with the same 21 days median value. In conclusion, pp ovarian activity impairment seems to explain partially poor reproductive performances in H breed.

Table 1. Breed effect on resumption of ovarian activity: cumulative percentage of cows which have achieved C-LA at 30 day pp (C-LA 30d) or 50 day pp (C-LA 50d).

Breed*	N	C-LA 30d (%)	C-LA 50d(%)
CH	125	32[a]	68[a]
NO	106	63[b]	92[b]
H	136	57[b]	79[c]

*Values within column with different superscripts differ significantly (a≠b, b≠c, P< 0.01; a≠c, P<0.05)

Key Words: ovarian activity, cows, breed

519 Prediction of wool fibre diameter from protein and metabolisable energy digestibility coefficients in crossbred sheep. A. E. O. Malau-Aduli*, R. E. Walker, and W. C. Bignell, *University of Tasmania, Hobart, Tasmania 7001, Australia.*

Our objective in this study was to investigate the interactions between sire breed and supplement on digestibility and to ascertain its accuracy in predicting wool fibre diameter. Forty first-cross Merino weaner sheep sired by Texel, Coopworth, White Suffolk, East-Friesian and Dorset sires with initial BW range of 22.9 and 31.3 kg (average of 26.8 ± 3.2 kg) were randomly assigned to four treatment groups in a 5 × 2 × 2 × 2 factorial experimental design representing 5 sire breeds, 2 supplementary feeds (canola and lupins), 2 feeding levels (1 and 2% of bodyweight) and 2 sexes (ewes and wethers). The feeding trial lasted for six weeks with an initial 3-week adjustment period and the last 7 days for faecal collection. Factorial ANOVA with orthogonal contrasts in SAS was used for statistical analysis to test for the interactions between sire breed and supplement on digestibility and wool fibre diameter. Our results demonstrated that sire breed × level of feeding interactions significantly influenced digestibility (P<0.01) whereby Coopworth-sired sheep supplemented at 1% of their body weight recorded the highest ME and N digestibility of 54% and 67% compared to 42% and 62% respectively, in their counterparts fed at 2% of body weight. There was a highly significant (P<0.01) effect of type of supplement x level of feeding interaction on wool fibre diameter at the end of the trial because sheep fed canola supplements at 1% of body weight had finer wool (22.1 microns) than their 2%-fed counterparts (25.4 microns). Regression of wool fibre diameter on digestibility revealed very poor prediction accuracy (R^2 = 0.0087-0.169). We concluded that sire breed variation in digestibility is unlikely to be a useful predictor of genetic merit for wool fibre diameter in first cross sheep under the same management.

Key Words: digestibility, wool, fibre diameter