Growth and carcass quality of crossbred Jersey bull and heifer calves

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Objective

To investigate if use of crossbreeding with beef breeds in Jersey herds will produce male and female offspring that can match the EU market for rosé veal.

Background

Most newborn bull calves of the Jersey dairy breed are killed at birth because their growth potential, feed utilization and carcass value is too low. Use of sexed semen to produce replacement heifer calves on the genetically best dairy cows and the low culling rate in Jersey leads to excess of heifer calves and opens for crossbreeding with beef breeds to the less superior Jersey cows in the dairy herds. Number of inseminations with beef breed semen to Jersey cows has increased in Denmark since 2011.

To be sold as veal in EU, the calf needs (by definition) to be slaughtered before 8 months of age. The market for rosé veal in EU requests a much higher carcass conformation score (>4.5) than a 8-month Jersey bull calf can match which is usually below 3.

Table 1. Body weight (BW) and daily gain (ADG) of purebred Jersey bulls (PURE), crossbred bulls (BULX), and crossbred heifers (HEIX)

	PURE	BULX	HEIX	*P*-value
Number of animals, n	11	11	12	
Age at start, d	32	35	41	0.11
Initial BW	44[a]	53[b]	49[ab]	0.03
Weaning BW	106	115	102	0.18
ADG before weaning, g/d	689	760	767	0.49
Age at slaughter, d	240	239	238	0.45
BW at slaughter, kg	256[a]	314[b]	263[a]	0.001
ADG in experiment, g/d	989[a]	1235[b]	1059[a]	0.001
ADG birth to slaughter, g/d	941[a]	1154[b]	962[a]	0.001

Conclusions

Carcasses of crossbred heifers (HEIX) had better conformation than carcasses of Jersey bulls (PURE) but the carcass weight of both were too low to make these two groups economically attractive.

A high proportion of carcasses with conformation >4.5 for crossbred bulls (BULX) compared with PURE, a reasonable carcass weight, and improved feed conversion suggests a market potential for the crossbred bull calves.

Table 2. Feed intake (FI) and feed conversion efficiency (FCE) from 4 to 8 months of age *(Covariate adjusted using age at start)*

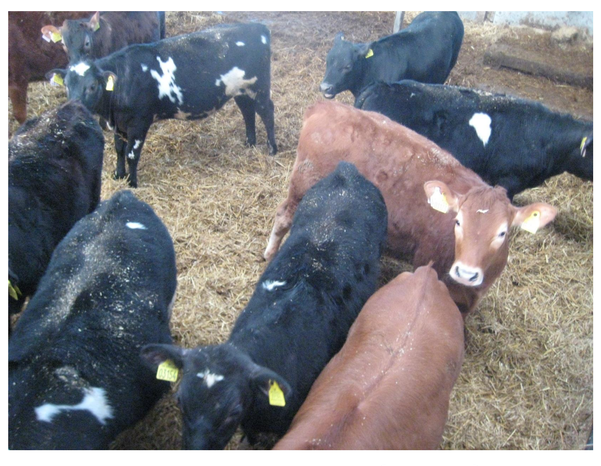
	PURE	BULX	HEIX	*P*-value
Age at start of FI recording, d	108	109	116	0.14
BW at start of FI recording, kg	101	116	112	0.07
ADG, kg/d	1.15[a]	1.48[b]	1.21[a]	0.001
Feed intake (FI), kg /d	6.7[a]	7.9[b]	7.4[ab]	0.004
Scand Feed Units (SFU)/d	5.1[a]	6.0[b]	5.5[ab]	0.004
NEI, MJ/d	39.9[a]	47.0[b]	43.7[ab]	0.004
FCE, SFU/kg gain	4.4[b]	4.0[a]	4.6[c]	0.001
Intake of digest. protein, g/d	627[a]	738[b]	686[ab]	0.003
Intake of starch, g/d	1781[a]	2097[b]	1949[ab]	0.004
Visits in feeder, n/d	30[a]	31[b]	48[b]	0.001

Table 3. Carcass quality and number of carcasses with premium

	PURE	BULX	HEIX	*P*-value
Carcass weight, kg	118[a]	161[b]	129[a]	0.001
Dresing percentage	48.1[a]	53.2[c]	51.7[b]	0.001
EUROP carcass conformation	2.8[a]	5.4[c]	4.6[b]	0.001
EUROP fatness	2.1[a]	2.3[a]	2.7[b]	0.01
Carcass lean/tallow colour	2,2	2,1	2,3	0.63
Carcasses with EUROP conformation score ≥ 4.5 /total	0/11	9/11	7/12	

Jersey bull calves (PURE) 7 months old

Crosbred bull calves (BULX) 7 months old



Crossbred heifer calves (HEIX) 7 months old

Materials and Methods

- Calves were purchased at 4-5 wk of age
- A total of 12 purebred Jersey bull (PURE), 12 beef x Jersey bull (BULX) and 12 beef x Jersey heifer (HEIX) calves were used
- One PURE and one BULX calf was culled from the experiment
- Two sires were used; one Limousin and one Belgium Blue (6 calves per crossbreeding group)
- Calves were fed milk replacer (600 (PURE) or 850 g/d (BULX and HEIX)), grass hay and concentrate pellets until weaning at 8 wk of age
- After weaning, calves were gradually changed to a high-energy TMR based on concentrate pellets, corn-cob silage (35% of DM in TMR), ground barley, sugar beet pulp, and soy bean- and canola meal fed *ad libitum* until 8 mo of age
- The concentrate pellets (1.4 kg/calf/d) were removed from the TMR at 200 kg BW
- Individual feed intake was recorded from 4 to 8 mo (Insentec® feeders).
- Calves were harvested 1-5 d before 8 mo of age
- Carcass weight, carcass conformation and fatness (EUROP scale) and carcass colour was recorded

Results

- At 4 mo, PURE, BULX and HEIX weighed 101, 116 and 112 kg
- ADG from 4-8 mo. was 1.15, 1.48 and 1.21 kg/d (P<0.001)
- BW at slaughter was 256, 315 and 263 kg, and FCE was 4.4, 4.0 and 4.6 Scandinavian FU per kg gain for PURE, BULX and HEIX, respectively (both P<0.001).
- Dressing percentage increased from 48.1 in PURE to 53.2 and 51.7 in BULX and HEIX, respectively, leading to carcass weights of 118, 161 and 129 kg with EUROP conformation score of 2.8, 5.4 and 4.6, respectively (all P<0.001).
- No PURE but 9 out of 11 BULX and 7 out of 12 HEIX passed the 4.5 EUROP conformation score criteria to receive a premium payment
- A high proportion of Belgian Blue or Limousin x JER bulls but not heifers can produce rosé veal that meets the EU market requirements with EUROP conformation > 4.5 and carcass weight of at least 150 kg.

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