



FACT SHEET

SEPTEMBER 2016

BENEFITS OF DAIRY FARMS USING BETTER BEEF GENETICS

Summary

The use of quality beef sires on a dairy farm and the impact on the progeny's performance was demonstrated. Ezicalve Hereford sires, which have high estimated breeding values (EBVs) for calving ease and live weight, were compared to unrecorded Hereford sires. Using some beef semen reduced the cost of mating by artificial insemination (AI). Ezicalve sires minimised calving problems, and despite having smaller calves at birth, their progeny performed similarly to those sired by unrecorded bulls during rearing and finishing. Sire had little effect on meat quality, but cattle from the Ezicalve sire with the highest live weight EBVs were quicker to reach slaughter targets and produced heavier carcasses than those from other Ezicalve AI sires. Using beef sires with high EBVs for calving ease and live weight on dairy farms therefore has benefits for both dairy and beef farmers.

Trial background

The New Zealand beef industry is increasingly reliant on calves sourced from dairy farms, but the sires of these calves are often of unknown genetic potential for beef production. On dairy farms, the use of beef sires with good EBVs (estimated breeding values) for calving ease and live weight can minimise the calving problems that are associated with using beef bulls and produce a calf of greater value to the beef industry. The Beef + Lamb New Zealand Dairy Beef Integration project compared the use of Ezicalve (high EBVs for calving ease and

live weight) to unrecorded Hereford sires on a dairy farm and assessed the impacts on mating, calving, calf rearing and beef finishing.

Trial methods

The low breeding worth (BW) Friesian and Friesian-Jersey cross cows on the AgResearch Tokanui dairy farm were artificially inseminated (AI) with Ezicalve Hereford beef semen over 6 weeks in spring 2011 and 2012. The sires had EBVs for calving ease in the top 1% for their breed and 600-day live weight EBVs of +43 kg (Caspian), +45 kg (Russia) and +69 kg (Rocket). This was followed up with 4 to 5 weeks of natural mating with a mix of Ezicalve and unrecorded Hereford sires.

The progeny (heifers and steers) of these matings were identified to sire and dam and their ease of calving and birth weight recorded. Calves were reared on the dairy farm then were transferred to the AgResearch Whatawhata hill country farm when they reached 100 kg. Cattle were managed under normal farm practice on pasture to target weights of 500 kg (heifers) or 600 kg (steers) then were processed at AFFCO, Horotiu. Feed supply and quality were limited over summer and autumn, with successive summer-autumn droughts impacting on live weight gain at this time.

Mating outcomes

Using some beef semen reduced mating costs by at least 20% per insemination. Ezicalve beef semen cost \$16.60 per insemination, compared to \$21 to \$29 for the dairy semen used in this herd. For natural mating, the likely impacts on calving ease and progeny performance should be considered along with other factors such as price when sourcing bulls.

Selecting cows for insemination with beef semen required minimal extra input time. The number of such cows to be mated to beef semen was calculated to ensure that enough dairy replacement heifers were born and reared foremost. This took into account the expected reproductive performance and calf losses. Only low BW cows were inseminated with beef semen throughout the AI period, so that dairy replacements were only bred from the higher BW cows.



Calving and calf rearing

No calves born to natural matings by Ezicalve bulls required assistance at birth, compared to 4% and 2% of calves sired by unrecorded bulls in 2012 and 2013, respectively. The only assistance for Ezicalve AI-sired calves was for one breech birth, which is not related to sire genetics.

Ezicalve AI sired calves were 3.5 to 4 kg lighter at birth than calves sired by unproven Hereford bulls. Calves sired naturally by Ezicalve bulls were similar in birth weight to Ezicalve AI calves in 2012, but similar to those sired by unproven bulls in 2013, reflecting differences in the birth weight EBVs for the Ezicalve natural sires used in the two years.

Despite lower birth weights, calves sired by Ezicalve bulls took a similar time to reach 100 kg live weight as those sired by unrecorded Hereford bulls. Live weight gains during rearing averaged across years were 0.66 kg/day for both Ezicalve AI and Ezicalve naturally sired calves and 0.65 kg/day for calves sired by unrecorded bulls.

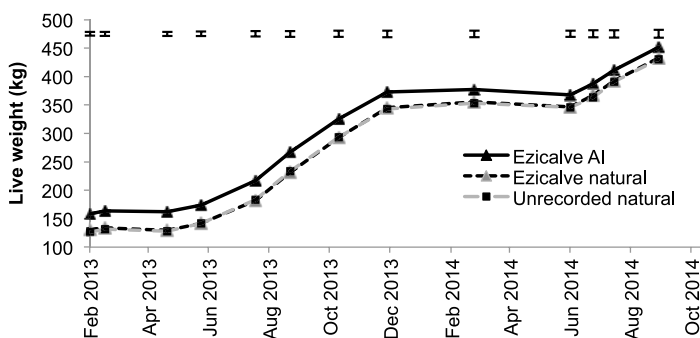
Using Hereford sires during AI on low BW cows made it easy to identify the remaining early-born heifer calves as high BW dairy calves to keep as replacements.

Beef finishing

Cattle sired by AI were consistently heavier during finishing than those sired naturally (Figure 1 and 2). This was a consequence of them being born an average of 5 weeks earlier as opposed to greater live weight gain. This earlier birth date provides a greater potential for finishing cattle before their second winter, although this did not occur in this study due to poor conditions for growth in summer and autumn.

Although average growth rates were similar across sire groups, within Ezicalve AI sires, the sire with the highest 600 day live weight EBV produced cattle with the highest growth rate during finishing in both the 2012 (0.04 kg/day advantage, $P < 0.01$) and 2013 (0.03 kg/day advantage, $P < 0.05$) born cohorts. This demonstrates an advantage of high sire live weight EBVs for finishing dairy beef cattle.

Figure 1. Live weight over finishing (to first slaughter) of 2012 born dairy beef cattle sired by Hereford Ezicalve AI, Ezicalve natural or unrecorded bull natural mating. Error bars represent LSD ($P < 0.05$).



The value of carcasses did not differ amongst Ezicalve AI, Ezicalve natural and unrecorded natural sires when adjusting for age of the animal. When comparing within Ezicalve AI sires (Table 1), the higher growth rate of



Rocket- than Caspian-sired calves resulted in these cattle having higher carcass weights at slaughter, being finished earlier (heifers only) and being of higher value during finishing and from birth. Date of slaughter, carcass weight, animal age and gender had more influence than sire on meat pH, fat colour and meat colour.

Figure 2. Live weight over finishing (to first slaughter) of 2013 born dairy beef cattle sired by Hereford Ezicalve AI, Ezicalve natural or unrecorded bull natural mating. Error bars represent LSD ($P < 0.05$).

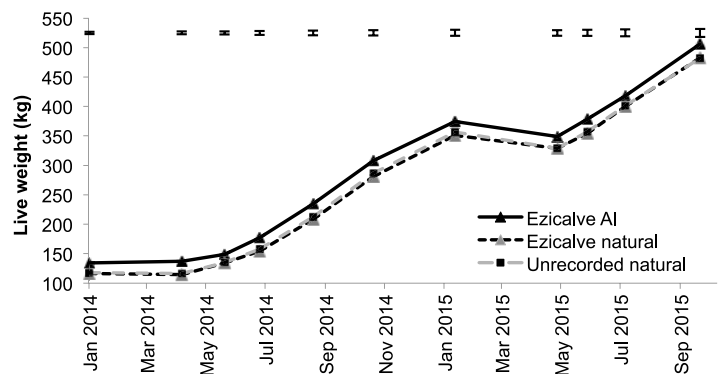


Table 1. Average carcass traits and value of heifers and steers sired by the Ezicalve AI sires Rocket and Caspian and born in 2012 and 2013. Cattle sired by Russia are excluded due to low semen supplies in the second year.

Trait	Heifers			Steers		
	Rocket	Caspian	SED	Rocket	Caspian	SED
Age at slaughter (days)	819	843	6.06***	907	915	13.0 ^{NS}
Carcass weight (kg)	254	245	2.23***	300	283	3.56***
DO%	49.0	47.7	0.23***	48.3	47.6	0.61 [†]
\$/carcass	1376	1291	23.7***	1481	1359	24.9***
\$/day from birth ¹	1.68	1.54	0.03***	1.65	1.48	0.03***
\$/day from 100 kg ²	1.90	1.75	0.03***	1.85	1.67	0.03***
pH	5.56	5.57	0.04 ^{NS}	5.70	5.58	0.06 ^{NS}
Meat colour	4.67	4.57	0.21 ^{NS}	3.92	3.95	0.19 ^{NS}
Fat colour	4.61	4.56	0.24 ^{NS}	5.53	5.70	0.13 ^{NS}

SED = standard error of the difference between means, NS= not significant, [†] = $P < 0.1$, *** = $P < 0.001$. ¹ Carcass price divided by days old at slaughter. ² Carcass price divided by number of days between reaching 100 kg live weight and slaughter.

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