



Raising dairy beef calves on a grain-free starter

Image credit: Megan Verdon

Research results

Research suggests no difference in productivity between grain-based and grain-free dairy calf starters.

The problem

The dairy industry is prioritising sustainable beef pathways for surplus calves (males and females not required for replacement purposes).

One option currently available to dairy farms is to raise surplus calves for grassfed beef markets. A challenge in achieving this is that to meet this raising claim, calves cannot be fed cereal grains or their by-products.

Conventional dairy calf rearing systems rely on the early intake of cereal grain-based calf starters to accelerate rumen development and facilitate early weaning. To date, little work has investigated the effects of a grain-free diet on pre- and post-weaning growth and development of dairy beef calves.

To address this, the Tasmanian Institute of Agriculture (TIA), Dairy Australia and Greenham funded a trial to assess the growth of dairy beef calves raised on a grain-free calf starter in comparison to a traditional cereal grain-based starter.

The impact

This work will support dairy beef producers to make informed decisions about which finishing pathways will deliver the best outcomes for their animals, and value for their businesses.

The outcome

There was no significant difference in growth rates or weaning weights between groups.

KEY POINTS

Sixty Speckle Park x Holstein calves were split into four groups and fed either grain-free or grain-based calf starter rations from three days of age to 16 weeks.

The results are positive for producers considering grassfed supply chain options for surplus dairy calves.

Not all grain-free starters are created equal. There are many different grain-free rations on the market with unique formulations that may impact calf growth differently. Speak to your nutritionist before deciding which ration is right for you.

Health is more likely to affect weaning times and rearing costs than a grain-free feeding regime. Optimising calf health and welfare is key to achieving weaning and growth targets. Best practice calf rearing starts with good colostrum management and attention to detail including good nutrition, a clean and comfortable environment and appropriate weaning.

The total costs of the two feeding regimes were comparable. Total feeding costs for the grain-based group were \$367.50/calf and \$374.80/calf for the grain-free calves.

What did the trial involve?

Conducted at the Tasmanian Institute of Agriculture's Dairy Research Facility, the trial found that calves fed grain-free calf starters exhibited similar growth rates and weaning weights, compared to those fed standard commercial grain-based starters.



The grain-based group were fed a conventional calf starter ration, containing a mix of cereal grains and their by-products.



The grain-free group were fed a cereal grain-free starter ration, containing faba beans.

Starter formulations were comparable in terms of protein (21% for grain-based and 20% for grain-free) and energy (12MJ/kg for both). Table 1 details the composition of each ration.

After weaning at 13 weeks, calves were housed outdoors with access to pasture and were supplemented with 2kg of starter per calf, per day.

Both groups were also offered a total of 5L of milk replacer per day via an automatic feeder.

Table 1 Composition of grain-based and grain-free starter pellets fed to calves in the trial

	Grain-based	Grain-free
DM %	91.4	92.1
Crude protein (% of DM)	21.3	20.8
Starch (% of DM)	33.6	23.4
Sugar (% of DM)	4.0	11.0
ADF (% of DM)	10.2	14.2
NDF (% of DM)	25.4	27.3
ME (MJ/kg DM)	12.5	12.5



What were the findings?

1 Rearing costs were similar

The amount of milk replacer and starter consumed was comparable between the two treatment groups. Feeding costs (starter + milk) were \$367.50 per calf for grain-based calves and \$374.80 per calf for the grain-free calves.

2 Growth rates were comparable

There were no significant differences found between the two treatment groups in pre-weaning growth, weaning weights or post-weaning growth.

Figure 1 Comparative weight gains between treatment groups

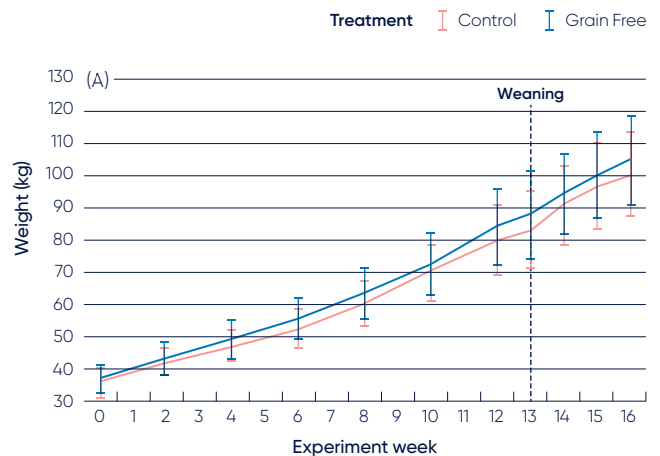


Table 2 Comparative weight gains between treatment groups (no significant differences, $P > 0.05$)

		Grain	Grain-free
Average weight (kg)	Entry	36.8	36.9
	Weaning	83.4	88.0
	Exit	101	105
Average days to double entry weight		75.7	72.6
Average daily gain (kg)	Pre-weaning*	0.52	0.52
	Post-weaning	0.80	0.80

3 Not all calf starters are created equal

The two starter rations used in this study were comparable in:

- ✓ protein
- ✓ energy
- ✓ dry matter (DM)
- ✓ carbohydrates (starch and sugars)

There are many different calf starter rations on the market that differ in their nutritional composition and therefore may affect calf growth differently. As fermentation of starch and sugars produces volatile fatty acids that accelerate rumen development, choosing grain-free starters that are comparable in protein, energy and carbohydrate content to cereal grain-based starters should limit any impacts on growth.

Managing calf health

Throughout the trial a high percentage of calves (32%) became sick and required treatment with antibiotics and/or anti-inflammatories. Calves that were treated multiple times consumed less milk and starter, were lighter at weaning and took longer to reach 100kg compared to calves that were only treated once or not at all. This highlights the importance of managing calf health and welfare, particularly when transporting dairy beef calves from their birth farm to a rearing facility.

Optimising the health and welfare of dairy beef calves will increase the likelihood of producing a high-quality animal that meets its growth potential. This includes a focus on colostrum management, good nutrition, a clean and comfortable environment and appropriate weaning.

MORE INFORMATION

Find more information on this topic on the [Dairy Australia website](#).



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