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HP 300 – The protein quality of the calf starter feed *makes the difference*

Weaning is a critical stage in calf development. During this transition, calves must adapt simultaneously to declining milk intake, increasing starter feed consumption and the progressive establishment of a functional rumen. The quality and digestibility of starter feed ingredients can therefore influence nutrient utilization, gut health and growth during this sensitive period.

Soybean meal (SBM) and rapeseed meal (RSM) are commonly used as protein sources in calf starter feeds. However, the rumen of a young calf is not yet fully developed and may not completely degrade dietary anti-nutritional factors (ANFs) before they reach the lower digestive tract. Selecting highly digestible protein sources with low levels of ANFs may consequently help support digestive development and maintain growth around weaning.

To evaluate the importance of protein quality, a series of trials was conducted in universities, research centers and commercial farms under different production conditions (Detail in Table 1). The studies compared conventional starter feeds containing SBM, either alone or in combination with RSM, with starter feeds in which these protein sources were replaced by HP 300, a highly digestible soy protein with reduced levels of ANFs.

The starter feeds were offered ad libitum, generally until two weeks after weaning. Growth performance was assessed throughout the feeding period, while feed intake and feed efficiency were recorded whenever available. The combined results provide a broad assessment of the response of young calves to improved protein quality in starter feed.

Bodyweight evolution

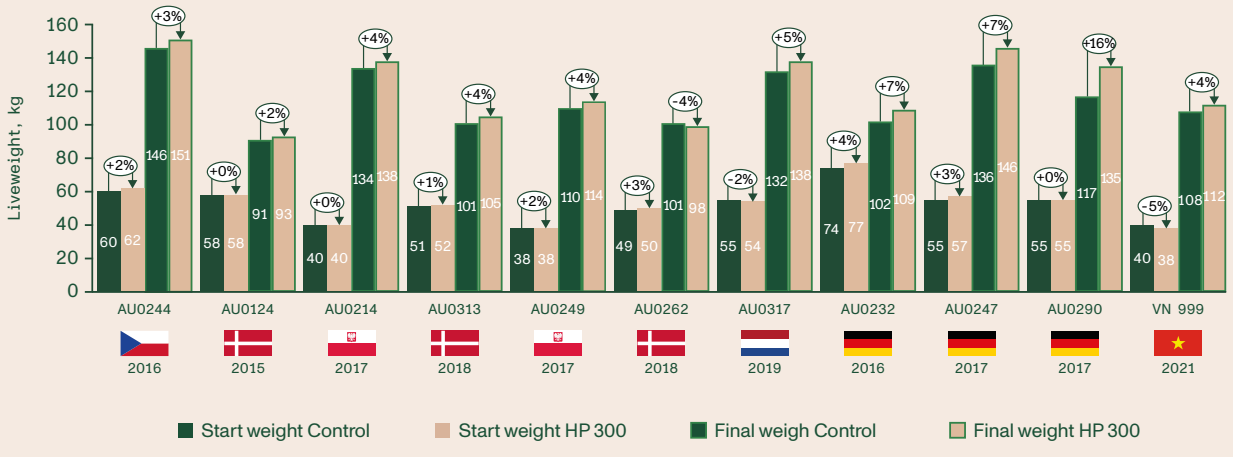

Figure 1 Comparison of live weights of calves at the start and end of the test of groups. Animals received either a control starter feed or a starter feed formulated with HP 300 (Details of the different trials in table 1 at the end of the document).

In 10 of 11 trials recorded, the weight gain of the HP 300 group was better than the control group. In most of the trials, we observe an improvement in the final liveweight between 4 and 7%.

Considering all the trials, the average weight gain on the weaning and immediate post weaning period went from 63.9kg with the control groups to 69.0kg for calves being fed with starters formulated with HP 300 (+5.0kg ; +7.9%)

Average daily gain

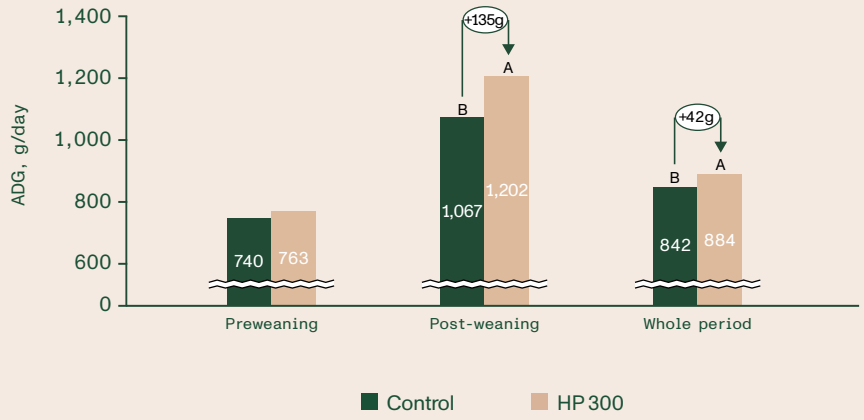

Figure 2 The average daily gain (ADG) pre-weaning, postweaning, and for the whole period (pre- and post-weaning) for calves fed a control diet containing soybean meal (SBM), either alone or in combination with rapeseed meal (RSM), and compared to calves fed a diet containing 14.0–23.8% HP-300. A,B indicates significant difference (P<0.01).

The combined meta-analysis of 11 studies involving 935 calves (Data were analyzed using a mixed model in SAS (version 9.4), with treatment, study, and their interaction included as fixed effects) showed that replacing conventional protein sources with HP 300 improved growth performance. Before weaning, calves fed HP 300 achieved a numerically higher ADG than control calves (763 vs. 740 g/day).

The response became more pronounced after weaning, when ADG increased by 135 g/day (1,202 vs. 1,067 g/day; P<0.01). Across the entire pre- and post-weaning period, HP 300 increased ADG by 42 g/day (884 vs. 842 g/day; P<0.01). These results suggest that the benefits of improved protein quality become particularly evident as starter feed intake increases around and after weaning.

Starter feed daily intake

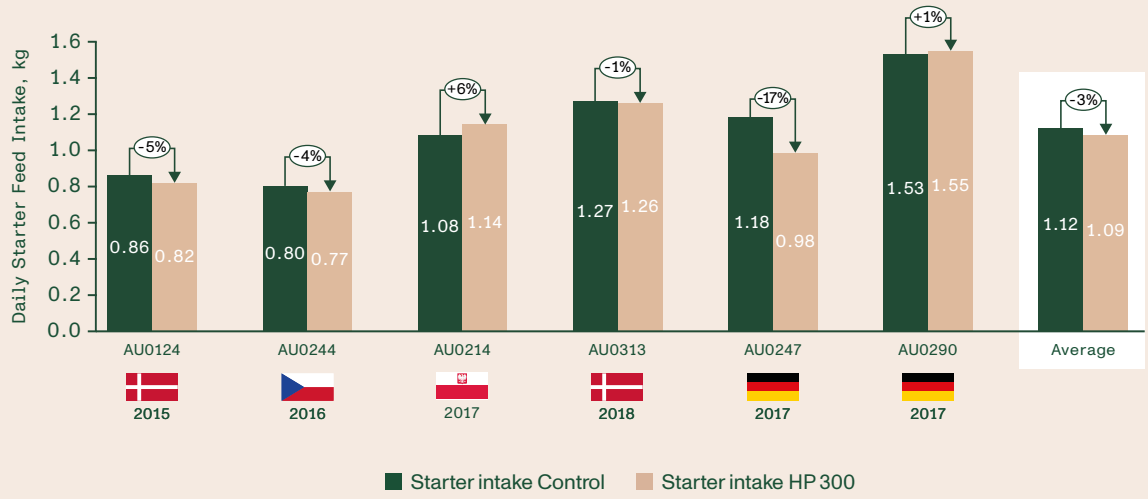

Figure 3 Comparison of average individual daily starter feed intake calves between the start and end of the trials of groups. Animals received either a control starter feed or a starter feed formulated with HP 300, both offered ad libitum. (Details of the different trials in table 1 at the end of the document).

Starter feed intake was measured in six trials. It was higher in the control group in four trials and in the HP 300 group in two trials. Overall, replacing conventional protein sources with HP 300 had little effect on daily starter feed intake. The improved growth performance therefore does not appear to be explained by greater starter feed consumption.

Feed efficiency

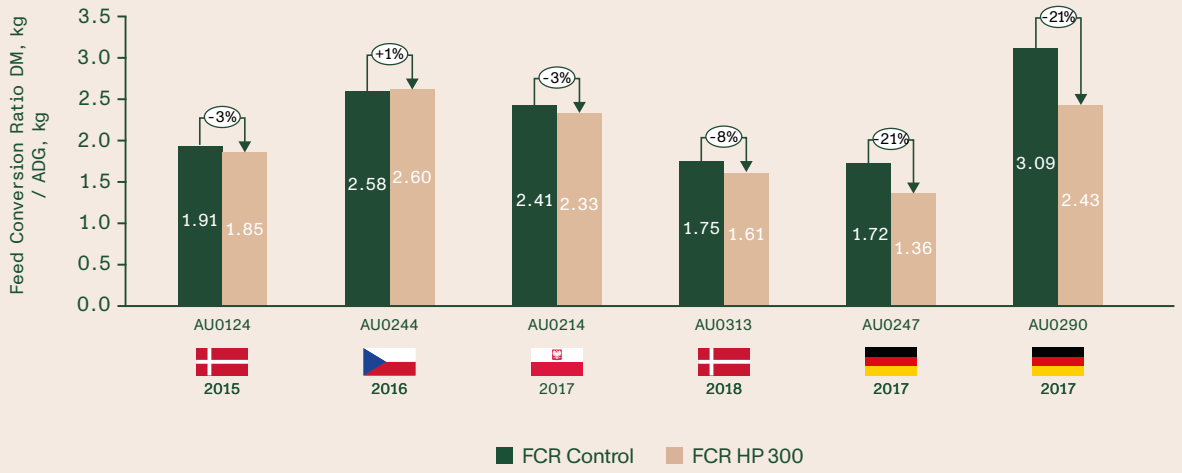

Figure 4 Comparison of feed conversion ratio between the start and end of the trials of groups. Animals received either a control starter feed or a starter feed formulated with HP 300. The FCR includes cumulative intake of calf milk replacer and starter feed. (Details of the different trials in table 1 at the end of the document).

In five of the six trials in which feed intake was recorded, calves fed starter containing HP 300 had a lower feed conversion ratio (FCR) than those fed the control starter. These results suggest that replacing soybean meal, alone or in combination with rapeseed meal, with HP 300 in starter formulations can improve the feed efficiency of the overall calf feeding program.



Conclusion

Replacing conventional protein sources in calf starter feed with HP 300 improved growth performance during weaning and the immediate post-weaning period. Across 11 trials, calves fed HP 300 achieved higher average daily gain, with the strongest response observed after weaning. This improvement was achieved without an overall increase in starter feed intake, suggesting improved feed efficiency. Supporting growth through this critical transition may help calves enter subsequent feeding, reproductive or finishing phases with a stronger performance foundation.

Table 1: Overview of calf starter feed trials

Study	Trial reference	Country	Year	Period, days	Weaning	Number of calves	Breed and sex	HP 300 inclusion, %	Replaced Protein in control starter feed
1	AU0124	Denmark	2015	13-42	42	382	Holstein, males	19.3	SBM
2	AU0214	Poland	2017	3-100	73	50	Holstein	14.9	SBM
3	AU0232	Germany	2016	28-84	49	79	Brown Swiss, males	14.1	SBM
4	AU0244	Czech Republic	2016	21-119	77	40	Simmental, males	14	SBM
5	AU0247	Germany	2017	14-108	84	57	Holstein, males	16	SBM+RSM
6	AU0249	Poland	2017	0-104	56	49	Females and males	15	SBM
7	AU0262	Denmark	2018	14-70	56	32	Holstein or Holstein x Belgian Blue (BB), males	23	SBM
8	AU0290	Germany	2017	14-82	70	81	Holstein x Limousine/ Charolais or Holstein x BB, females	16	SBM+RSM
9	AU0313	Denmark	2018	14-70	49	32	Holstein or Holstein x BB, males	23.8	SBM
10	AU0317	The Netherlands	2018	15-108	56	121	Dutch Rosé Veal Calves, males	16	SBM+RSM
11	VN-999	Vietnam	2021	0-90	70	12	Holstein, females	15	SBM

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