HAMLET PROTEIN®
a nuscience brand



HP 100 – The best of soy protein for *safe weaning* of young ruminants

Soy protein has an *excellent amino acid profile*

For amino acids (AA), the newborn ruminant functions as a monogastric, and each AA has its importance. Milk and soy proteins have very similar AA profiles, while the wheat gluten profile differs considerably (low in lysine as illustrated in figure 1, and high in glutamic acid).

HP 100 and milk protein have very similar profiles of essential amino acids

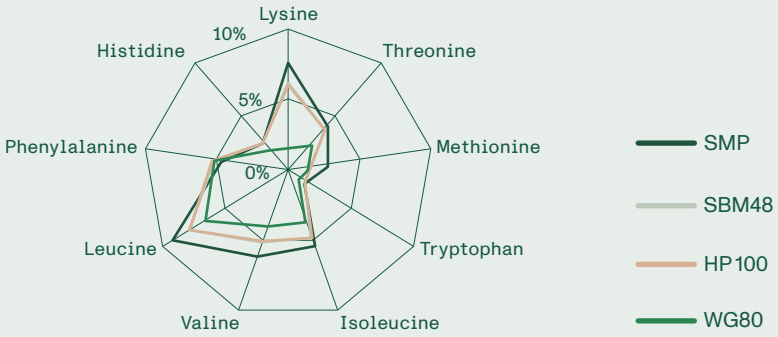


Figure 1 Comparison of amino acid profiles of skim-milk powder (SMP) 48% CP soybean meal (SBM48), HP 100, and 80% CP wheat gluten (WG80).

The paradox of soy; optimal profile as protein ingredient - except for young animals!

Soybean meal (SBM) is an excellent and easily accessible source of protein. However, it naturally contains anti-nutritional factors (ANF's) that challenge the immature digestive tract of young animals. Soy ANF's are known to cause protein malabsorption, inflammation of the digestive tract, and diarrhea, which compromise growth and performance and reduce feed efficiency in young animals.

Trypsin inhibitors (TIA) have deleterious effects on protein digestion and the health of the intestinal wall.

Galacto-oligosaccharides (GOS) such as stachyose and raffinose are not digested in the intestine of the newborn ruminant but fermented by the bacterial flora in its terminal part with negative effects on health and well-being.

Allergenic globulins such as beta-conglycinin, cause inflammation of the intestine and diarrhea.

The presence of ANF's in feed for calves disrupts the intestinal villi

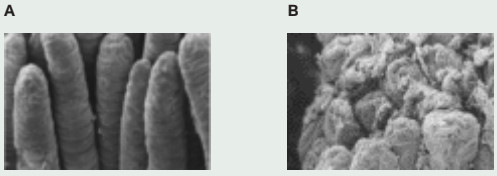


Figure 2 A) Diet containing soy protein low in ANF's and **B**) Diet containing soy protein high in ANF's.

The Hamlet Protein *processing technique* makes *soy safe* for young ruminants

Our patented enzymatic process reduces soy ANF's to a minimum resulting in a concentrated, high-quality soy protein with the lowest level of ANF's in the market.

HP 100 vs SBM: Consistently low in ANF's

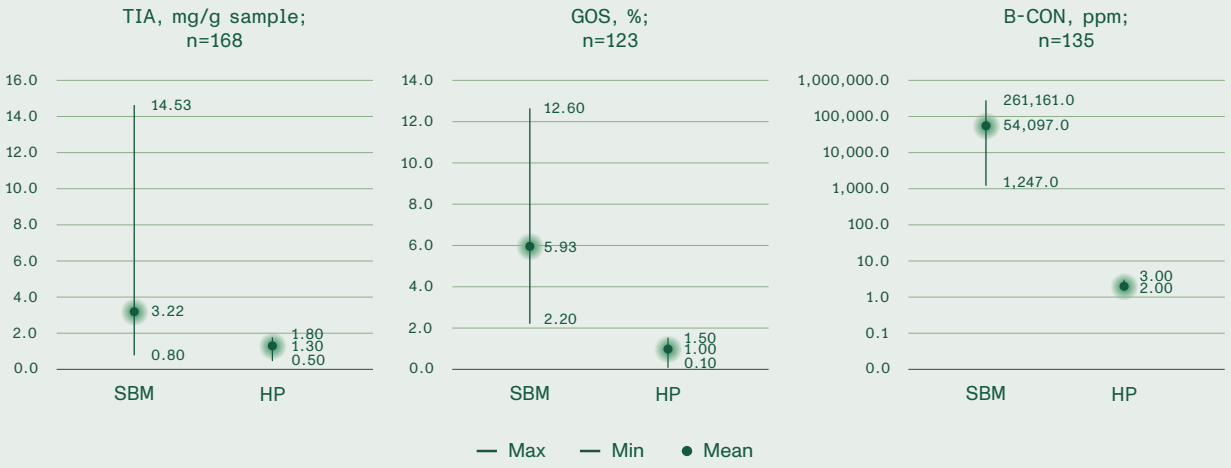


Figure 3 Comparison of analytical levels of the anti-nutritional factors (ANF's) trypsin inhibitors (TIA), the galacto-oligosaccharides stachyose and raffinose (GOS), and the antigen beta-conglycinin (B-CON) in soybean meal (SBM) and HP 100.

HP 100 contains a high proportion of small peptides, facilitating rapid absorption and high digestibility

Hamlet Protein's unique manufacturing process is comparable to an enzymatic pre-digestion and modulates the structure of raw materials, which results in a proportion of small peptides (≤ 500 Da) that is up to 5 times greater in HP 100 compared to traditional SBM. The amino acids of HP 100 are highly digestible and are faster absorbed than those of SBM. In fact, HP 100 results in the same high digestibility of CMR as whey protein concentrate (figure 4).

Similar protein digestibility of CMR with whey and HP 100

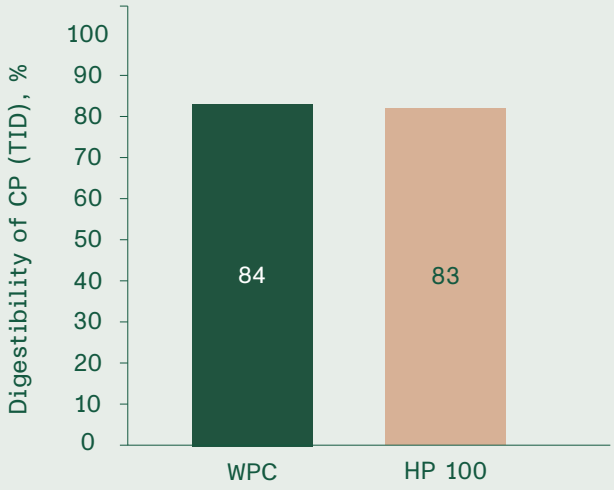


Figure 4 Ileal digestibility of protein in CMR with whey protein concentrate (WPC) as the main protein source and a CMR where half of WPC is replaced by HP 100 (Ansia et al., 2020; AU0202).

HP 100 is highly digestible and contributes to *intestinal health* but also to the growth of the young ruminant and the valorization of its diet

HP 100 encourages the spontaneous ingestion of dry starter feed (figure 5). This additional intake accelerates the growth rate (figure 6) without compromising the feed efficiency of the liquid and solid feed. The growth gains recorded at weaning persist post-weaning, attesting to facilitated ruminal adaptation. The presence of safe, high-quality vegetable proteins in the milk replacer is an asset for the dietary transition of milk-fed veal to the fodder ration that it will consume for 90 to 98% of its life.

HP 100 in CMR improves starter feed intake and FCR

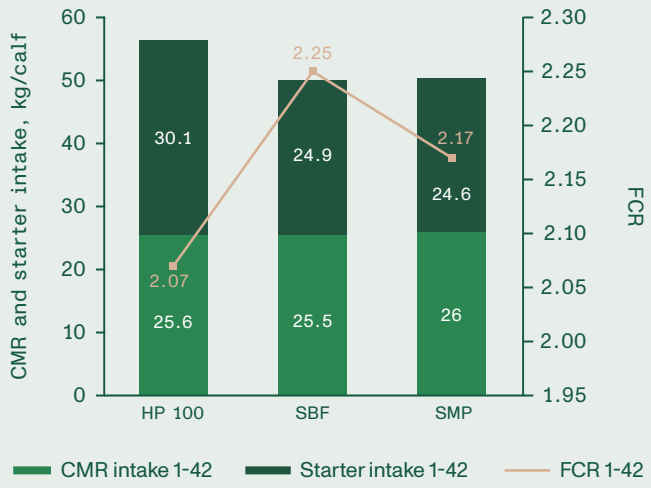


Figure 5 Pre-weaning feed intake (CMR + starter feed) and feed efficiency (FCR) in calves fed a CMR containing HP 100, soybean flour (SBF), or skim-milk powder (SMP) (FT100C08).

HP 100 in CMR improves pre- and post-weaning weight of calves

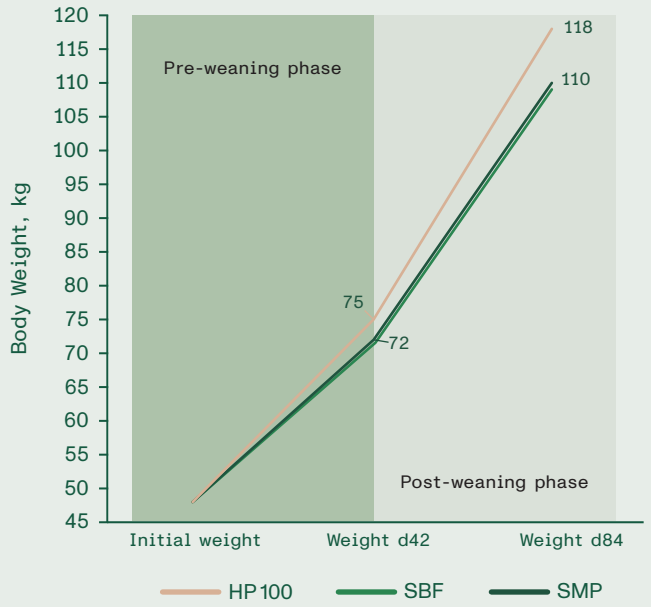
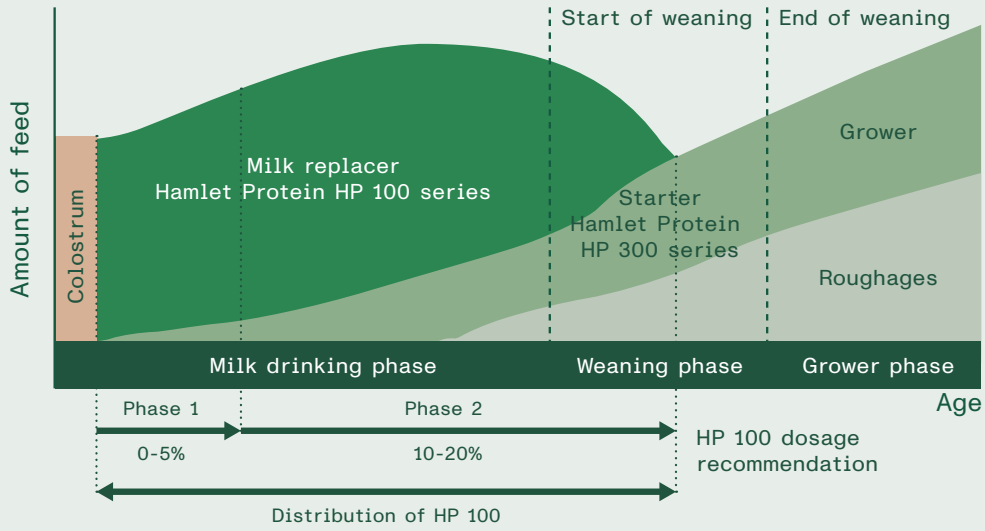


Figure 6 Pre- and post-weaning body weight (kg) of calves fed HP 100, soybean flour (SBF) or skim-milk powder (SMP) in CMR and fed a common starter feed (FT100C08).

HP 100 – application

- To be incorporated into liquid feed replacing part of dairy protein in CMR.
- Can be used as top dressing in case of cow's milk distribution to rebalance protein and fat contents.
- To be used only during the milk-feeding phase that starts after colostrum distribution.
- In case of two-phase program, start with a low dosage (phase 1) CMR (< 5% HP 100) and increase the dosage in phase 2 (10-20% HP 100).



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References

Ansia, I., Stein, H.H., Vermeire, D.A., Brøkner, C., Drackley, J.K. 2020. Ileal digestibility and endogenous protein losses of milk replacers based on whey proteins alone or with enzyme-treated soybean meal in young dairy calves. Journal of Dairy Science. 103: 4390-4407.



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