

PerLYS & PerMET

—Rumen-bypass Amino Acid



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Hunan Perfly uses the substances that are resistant to rumen degradation to coat the active components to develop rumen-bypass lysine-PerLYS and rumen-bypass methionine-PerMET successfully. The unique coating technology ensures the products to bypass rumen successfully to be released in the small intestine.

●Composition

Guaranteed analysis:
PerLYS: lysine content ≥ 35%, moisture content ≤ 6%
PerMET: methionine content ≥ 50%, moisture content ≤ 6%

●Product Features

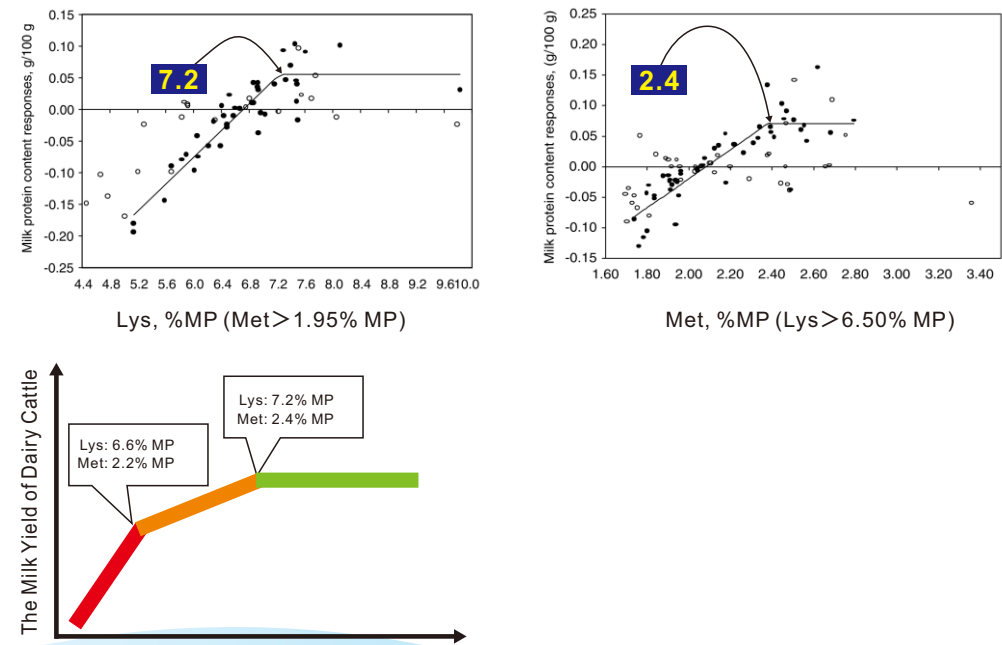
Good fluidity, easily mixing, safety pelleting, rumen-bypass rate ≥ 87%, release rate in small intestine ≥ 93%.

●Action Mechanism

Amino Acid Balance in Ruminant Animals

The core of protein nutrient for ruminants is the amino acid nutrition. Because the key amino acids limit the synthesis of milk protein, the premise of amino acids nutrient is to ascertain which key amino acids are. The aims of amino acid balance in dairy cattle dietary are to increase the primary key limiting amino acid contents in metabolizable protein (MP), and make it to maintain the balance with other limiting amino acids for promotion of milk protein synthesis, effective the genetic potentialities of milk yield and milk composition, the conversion maximization from MP to milk protein. The aim of amino acid nutrients for ruminants is to balance many kinds of amino acids in small intestinal metabolizable protein (MP) to play the roles of decreasing metabolic disorder, giving play to genetic potential, decreasing dietary protein waste, promoting growth and development, improving milk yield, improving reproductive performance, improving milk composition and improving economic benefits.

Many studies have shown the most important limiting amino acids for dairy cows were lysine and methionine (Rulquin, 1987; Fraser, 1991; Schwab, 1992). Lysine content accounts for 7.2% of MP and methionine content accounts for 2.4% of MP respectively according to the nutrition standard of dairy cattle (NRC 2001). For cattle, sheep and other fattening animals, the most important limiting amino acids are lysine and methionine.



Because animal protein materials are prohibited for use in ruminants, it is difficult for lysine and methionine to meet the requirement of ruminants in conventional raw materials formula. Extra lysine and methionine are needed to add for balancing amino acid. However, the addition of crystalline lysine and methionine was hard to reach ideal effect because of their rapid deamination in the rumen. (Onodera et al., 1993) Therefore, when daily ration is formulated, theory of amino acid balance in small intestine should be applied and rumen-bypass amino acids are added according to the circumstance to meet production requirement of ruminants.

Rumen-bypass Amino Acid

Relative to monogastric animals, ruminants have a strong microbial “fermentor”-rumen. Therefore, the direct addition of amino acids or proteins in the ruminant feed will reduce the effective utilization rate due to the degradation of the rumen microorganisms. Even if the amount of protein feed is increased, its effective utilization rate is not improved. Onodera et al. reported that the addition of crystalline lysine and methionine was ineffective because of their rapid deamination in the rumen in 1993. Therefore, the application of rumen protection and intestinal release technology is essential for the monomer amino acid supplement. The technology can reduce the loss of monomer amino acid in the rumen.

●Efficacy

1. This product precisely achieves the balance of amino acids, increases the absorption of amino acids in abomasum and small intestine for preventing the lack of amino acids in animals and improving the feed conversion rate.
2. This product can increase milk yield: the milk yield is increased by 1.0-5.0kg, per head per day in average.
3. This product can improve the milk protein rate obviously: 0.1-0.3% increase in milk protein rate.
4. This product can improve fattening effects of beef cattle and mutton sheep, at least 0.2kg increase in beef cattle’s weight gain and about 50g increase in mutton sheep’s weight gain.
5. This product can strengthen immunity and improve reproductive performance.

●Trial Effect

1. PerLYS – Rumen-bypass Lysine
- 1.1 Adding PerLYS can improve milk yield and milk protein content, see Figure 1. and Figure 2 (data from: Hebei Agricultural University, Oct. 2016).

Figure 1. The Effect of PerLYS on Milk Yield (kg/d) of Dairy Cattle

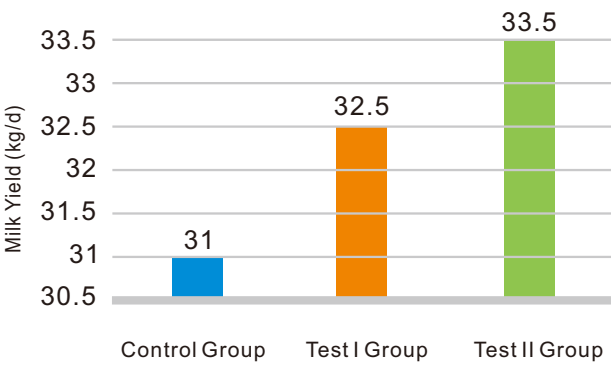
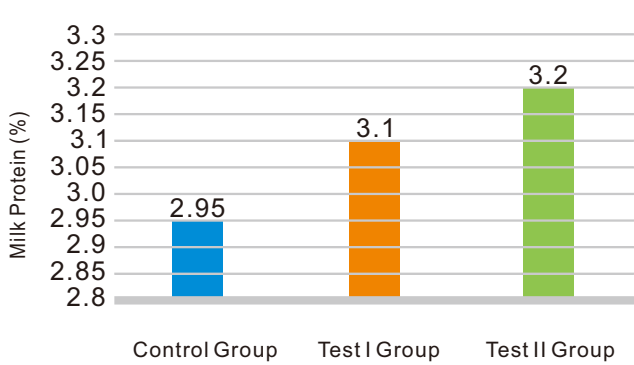


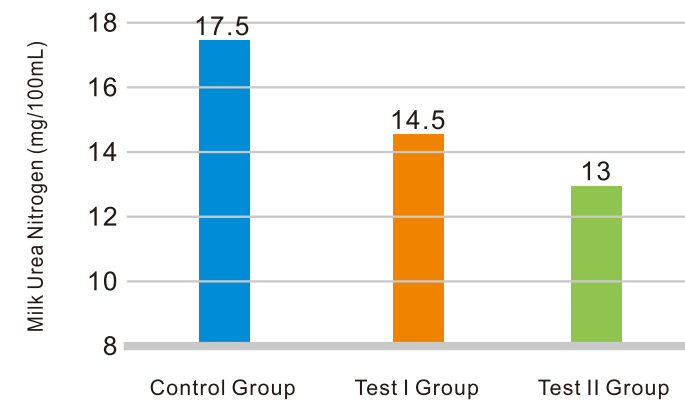
Figure 2. The Effect of PerLYS on Milk Protein (%) of Dairy Cattle





1.2 Adding PerLYS can reduce the milk urea nitrogen concentration and improve the feed nitrogen utilization rate, as shown in Figure 3.

Figure 3. The Effect of PerLYS on Milk Urea Nitrogen Content (mg/100mL)



Note: 120 lactation Holstein cows were selected in a cattle farm of Yili Group, Dingzhou, Hebei. PerLYS was added in Test I Group, add volume was 20g/each/day; PerLYS was added in Test II Group, add volume was 30g/each/day. The average parity is 2.5 fetus; lactation period is 115 days.

1.3 Adding PerLYS can improve production performance of cattle.

Table 1. The Effect of Adding PerLYS on Daily Gain of Xin Jiang Hybrid Brown Cattle (kg)

Item	Groups			
	Control Group	Test I Group	Test II Group	Test III Group
Initial Weight	307±8.56	311±12.89	313±14.24	309±13.57
Final Weight	389±11.36	395±15.72	415±16.29	418±20.12
Daily Gain	1.10±0.2	1.13±0.08	1.36±0.09	1.45±0.18

Note: The test was conducted to choose 18-month-old Xing Jiang hybrid brown cattle, the number was 40, weight was about 300kg/each, they were randomly divided into 4 groups, and each group had 10 cattles. Test I Group: basic concentrated supplement fodder+0.1% PerLYS; Test II Group: basic concentrated supplement fodder+0.2% PerLYS; Test III Group: basic concentrated supplement fodder+0.3% PerLYS. Prestart feeding period was 15 days, feeding period was 75 days.

2. PerMET – Rumen-bypass Methionine
2.1 Adding PerMET improves milk yield and milk protein content and butter-fat content, see Table 2 (data from: bulls test station in Hebei, Mar. 2016).

Table 2. The Effect of Adding PerMET on Milk Yield, Milk Protein and Butter-fat Content

Item	Days	Control Group	Test Group
Milk Yield (kg/d)		32.1±3.48	34.3±2.82
Milk Protein Rate (%)	1st day	3.08±0.03	3.01±0.06
	28th day	3.12±0.04	3.19±0.07
	49th day	3.15±0.02	3.27±0.09
Butter-fat Content (%)	1st day	3.38±0.17	3.42±0.20
	28th day	3.45±0.19	3.52±0.15
	49th day	3.43±0.26	3.64±0.23

2.2 Adding PerMET reduces the milk urea nitrogen, serum urea nitrogen concentration, and increases serum total protein concentration, see Figure 4. and Figure 5.

Figure 4. The Effect of PerMET on Milk Urea Nitrogen and Serum Urea Nitrogen

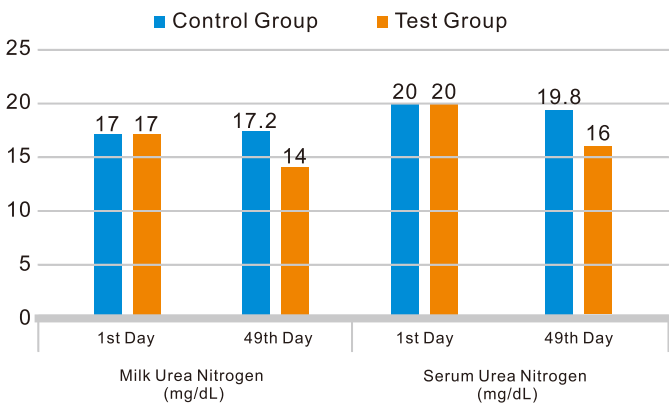
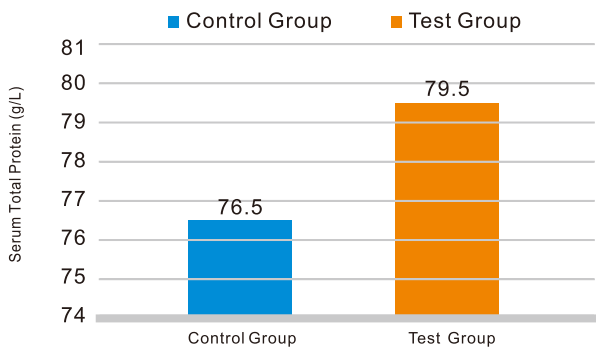


Figure 5. The Effect of PerMET on Serum Total Protein (g/L)



Note: This test was conducted to choose 40 lactating Holstein cows, the average parity is 1-2 fetus, lactation period was 60±2 days, PerMET was added in the test group, add volume was 20g/each/day.



2.3 Adding PerMET can improve production performance of mutton sheep.

Table 3. The Effect of PerMET on Production Performance of Mutton Sheep (add dosage 3.0g/each/day)

Item	Control Group	Test Group
Initial Weight (kg)	23.0±0.12	23.2±0.6
Final Weight (kg)	35.1±0.6	39.3±0.8
Daily Gain (g/d)	201±19	267±21
Dry Matter Intake (g/d)	982±65	986±68
F/G	4.86±0.2	3.69±0.3

Note: 12 healthy F1 lambs (small tailed Han sheep × Poll Dorset) were chosen, the test was carried out after castration. They were randomly divided into 2 groups, each group had 6 replicates. Prestart feeding period was 10 days, feeding period was 60 days.

2.4 Adding PerMET can improve daily gain of beef cattle.

Table 4. The Effect of PerMET on Daily Gain of Beef Cattle (kg/each)

Groups	Initial Weight	Final Weight	Total Weight Gain
Group I	286.32±23.68	407.82±45.13	121.5±12.82
Group II	292.13±35.45	404.63±54.23	112.5±17.64
Group III	287.33±31.36	386.33±35.10	99±15.3
Control Group	288.78±28.23	351.78±37.24	63±14.29

Note: 20 healthy Fuling buffalo with similar age were chosen, they had good meat performance, weight was about 290kg/each, PerMET was added in Group I, add volume was 30g/each/day, PerMET was added in Group II, add volume was 20g/each/day, PerMET was added in Group III, add volume was 10g/each/day, the test period was 90 days.

3. Adding PerLYS and PerMET simultaneously

Adding PerLYS and PerMET simultaneously can improve milk yield and milk protein and butter-fat content, see Figure 6. and Figure 7 (data from: a dairy farm in Hebei Capital Agribusiness Group, Oct. 2016).

Figure 6. The Effect of Adding PerLYS and PerMET Simultaneously on Milk Yield

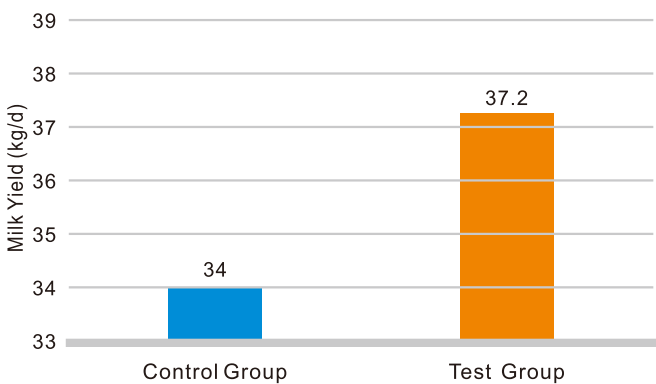
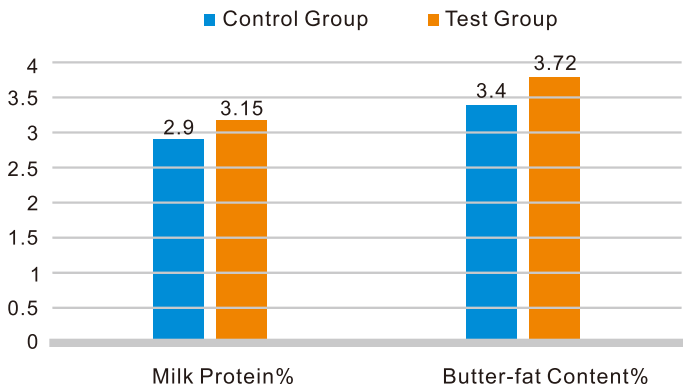


Figure 7. The Effect of Adding PerLYS and PerMET Simultaneously on Milk Quality



Note: This test was conducted to choose 100 lactating Holstein cows, the average parity is 2.5 fetus, PerLYS and PerMET were added in the test group, add volume was 30g/each/day, 20g/each/day, respectively.

●Species

Dairy cattle, beef cattle, goat, mutton sheep and other ruminants.

●Usage & Dosage

Table 5. The Additive Amount of PerLYS and PerMET in Feed of Different Ruminants

	PerLYS	PerMET
Dairy Cattle	10-50g/each/day	10-40g/each/day
Beef Cattle	10-50g/each/day	5-30g/each/day
Sheep	2-10g/each/day	2-6g/each/day

Note:

1. In order to ensure uniformity in the feed, the use of this product need to be premixed firstly, and then gradually added to the follow-up feed.
2. Add into forage directly with even mix. Do not to soak with hot water.
3. It would be best to adjust the formula by formulator according to the balance of available amino acids for small intestines.
4. This product is used as soon as possible after unpacking, the remaining parts need to tie up and keep in dark place.

●Packaging & Storage

This product is packaged in a bag or barrel, the net weight of product is 25kg, and details see the package label.
Keep away from heat, moisture and direct sunlight, not with toxic and harmful substances mixed.
Under the condition of original package, the shelf life is 12 months.