



PerFerrous Plus

A New Generation Product
for Replenishing Blood and Shortening Hair



PerFerrous Plus can both improve animals' demand for Fe^{2+} for replenishing iron synchronously and control the growth of hair, produced by Hunan Perfly Biotech Co., Ltd., so it is the product of hemogenesis and shortening hair for animal use.

Composition

Erythroid precursor proliferation stimulating factor, organic ferrous preparation, hair growth regulatory factor, synergist and so on.

PerFerrous Plus I (the Contents of $\text{Fe}^{2+} \geq 20\%$, Enhanced Type)

PerFerrous Plus II (the Contents of $\text{Fe}^{2+} \geq 15\%$, Universal Type)

Situation&Problems

Because culturists often concern about the appearance of pigs after feeding, the additives for red skin and bright hair are often used in the practical feed production.

1 Current situation and problems of red skin

Organic arsenic preparation in the products for red skin and bright hair has been used for many years. Through damaging the capillaries and paralyzing vascular wall smooth muscle, it causes permeability of vascular wall to increase resulting in expanding capillaries to show the effect of red skin and bright hair eventually. Because it is an improper manifestation of sub-intoxication by pharmacological stimulus, more and more nutritionists have abandoned this approach.

Currently, the main products that accelerate circulation of blood are organic iron preparations, such as amino acid chelated iron, organic acids iron, yeast iron, peptide iron, etc. The bioavailability of Fe^{2+} in organic iron preparations is high. It is hoped that the animal can absorb the more iron supplemented in feed to synthesize the more hemoglobin resulting in energetic blood and red skin and bright hair.



ALL FOR LIFE

The absorbing capacity of iron by animals mainly depends on the body's demand. If the body requires more iron, more iron can be absorbed by the body; and vice versa. The body will eliminate the excess, which is called as the body's iron balance phenomenon (see Figure 1.). So the absolute bioavailability of Fe^{2+} in feed often fluctuates between 4% ~ 40%; the body needs more iron at young stage and utilization rate of iron in daily diet can be up to 30% ~ 40%; with the increase of day-old, the body's demand for iron is reduced; iron utilization rate in the diet also gradually is reduced until it is down to 4%. So if there is no increase in body requirements of iron essentially, even animals have been fed with high bioavailability organic iron preparation, the result fallen well short of red skin and bright hair goals, because of limited increase of iron utilization rate and less the synthesis of hemoglobin.

Improving body's iron requirements is a precondition for the high bioavailability iron preparation supplements to achieve better results.

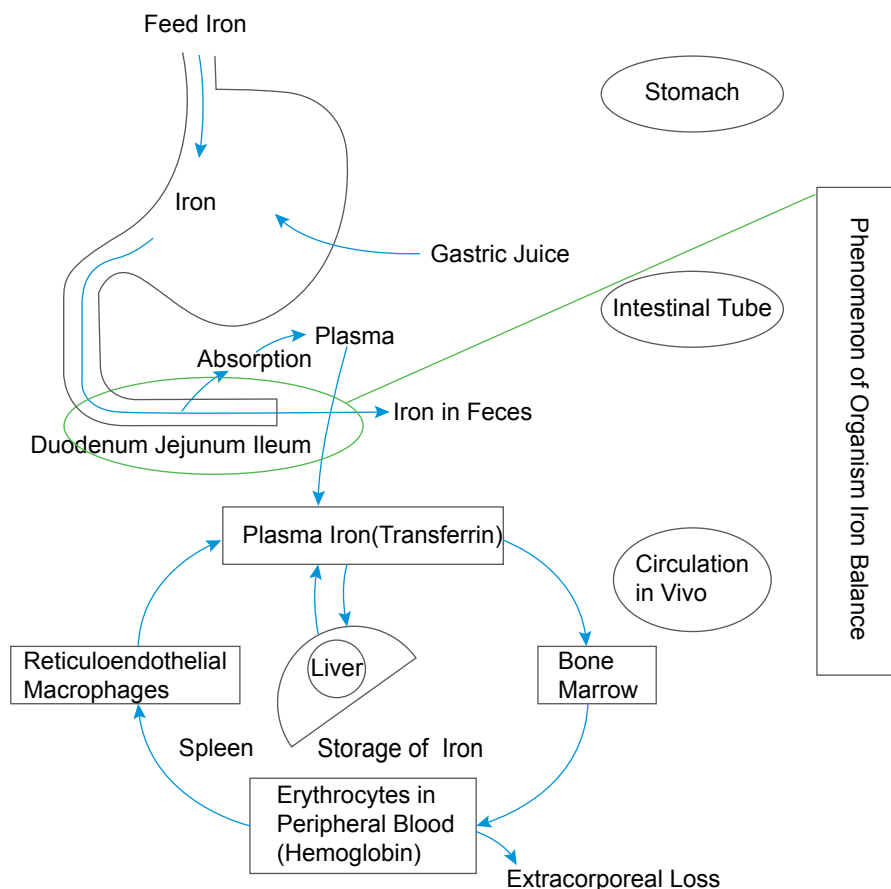


Figure 1. Phenomenon of Organism Iron Balance



2 The short hair and smooth hair issues

Hair problems of pigs are more complicated, such as long hair problem, short hair problem. They are related to both “energy” and “hair growth regulatory”; curly hair problem mainly associates with the parasite; the problems of yellow and split ends generally are related to vitamins; the problems of coarse hair and black spots are related to minerals; the problem of coarse hair in the spine of pigs is related to balance of amino acid, etc.; of course, the latter problems are generally accidental phenomena. At present, “how to achieve the goal of short hair and smooth hair” is generally concerned problem in our industry.

Action Mechanism

1 PerFerrous Plus stimulates the proliferation of the erythroid precursors of animal and increases the amount of erythrocytes and blood, increasing the body’s demand for iron.

Iron is mainly distributed in hemoglobin of erythrocyte [accounts for over 66% of the body iron (see Figure 2.)], so the synthesis of hemoglobin is the largest response to iron demand. Hemoglobin is synthesized in the cytoplasm of erythroid precursor while erythrocytes division is in process (see Figure 3.). So stimulating the proliferative activity of erythroid progenitor can increase the synthesis reaction of hemoglobin to increase the body’s demand for iron.

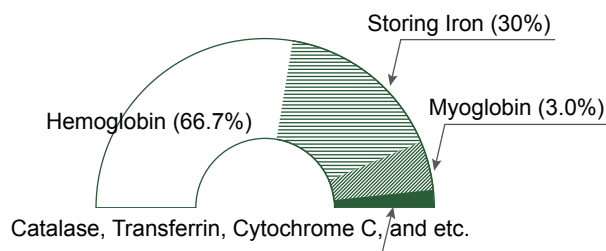


Figure 2. Iron Distribution in Body

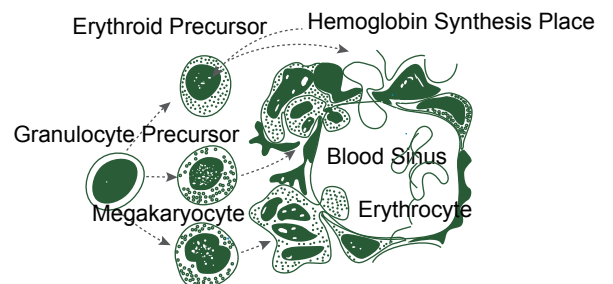


Figure 3. Synthesis of Hemoglobin

The function of PerFerrous Plus:

- PerFerrous Plus regards erythroid hematopoietic progenitor as target cell to promote the proliferation of erythroid hematopoietic progenitor to differentiate into the precursor cell (proerythroblast).
- PerFerrous Plus promotes the mitosis of nucleated red blood cell (including archaocyte and normoblast), which accelerates maturity.
- PerFerrous Plus promotes the synthesis of hemoglobin.
- PerFerrous Plus causes the reticulocyte and mature erythrocyte to release.

Through the above four functions, PerFerrous Plus stimulates the division, differentiation and development of erythroid precursor, and increases the amount of erythrocytes and blood for the final purpose of increasing the body's demand for iron.

2 PerFerrous Plus provides organic ferrous preparation with high bioavailability for the synthesis of hemoglobin.

At the first stage of differentiation of erythroid precursor (proerythroblast stage), there is the synthesis of hemoglobin in the cytoplasm; later the process is gradually strengthened; it does not stop until the mature red blood cell emerged. Biosynthesis of hemoglobin requires a lot of ferrous ion.

Inorganic iron in feed that must be combined with proper organic ligand in gastrointestinal tract is beneficial to be absorbed by animal. Because of the insufficient in the quantity of organic ligand and the influence of some negative components (such as oxalic acid, phytate, phosphate, etc.), biological utilization rate of inorganic iron is relatively low. Numerous studies have confirmed that the organic trace elements can improve the bioavailability of inorganic iron. Our PerFerrous Plus contains 15% of iron, and the iron is a kind of organic ferrous with high bioavailability.

The pharmacokinetic study found that animals had the peak concentration (mg/L) of ferrous in blood after 4.5 hours in which they had been fed, for satisfying iron needs to the hemoglobin synthesis.



3 Organic ferrous preparation is stable and less effected by dietary factors. The antagonism between organic ferrous preparation and other mineral elements is low. Besides, it has minimal catalytic and destructive effect on some vitamins and other components in feed.

The biggest differences between organic and inorganic ferrous are the “electronic effect” and “spatial effect” of the organic part.

- “Electronic effect” refers to, negative charges in organic part uniformly are distributed in a number of atoms to form the conjugated system, and the electron cloud of the conjugated system can in the largest degree shield positive charges of iron.
- “Space effect” refers to, because of the huge volume of organic radical ion, it is difficult for other molecules or ions to access to the iron with positive charges, and so the movement speed of the salt molecules (or ion pair) is relatively reduced.

Because of the electronic effect and spatial effect, the organic ferrous preparation is relatively stable and is not easy to be oxidized into ferric iron, and is not easy to interact with other dietary components (including other mineral elements, vitamin feed and oxalic acid, phytate and other components). So it is more effective and safer.

4 Unique hair growth regulatory factors can regulate pig hair growth to achieve the requirement of short hair and smooth hair.

Efficacy

1 PerFerrous Plus can improve piglets’ blood physiological status and maintain normal level of blood cells and haemochrome to prevent from many types of anemia; it improves the body’s demand for iron for the purpose of promoting the absorption of iron in feed. It increases the content of erythrocyte and hemoglobin to improve capacity in blood supply and to accelerate the circulation of blood leading to the healthy and ruddy skin.

2 It can regulate the hair growth in order to realize the short hair and smooth hair on condition that pigs are healthy.

3 It improves sows iron nutrition and reproductive performance for the purpose of improving the litter size and piglets birth weight; it also improves the iron storing content of newborn piglets and iron content in breast milk for reducing piglets' mortality, promoting growth and improving the weaning weight.

Usage&Dosage

Per T fodder allowed to add this product:

Concentrated feeds, premixes are in proportion to add this product after conversion:

	PerFerrous Plus I (g/T)	PerFerrous Plus II (g/T)
Pregnant, Lactating Sows	120-170	180-250
Poultry	50-100	100-200
Piglets	120-170	180-250
Aquaculture	50-100	100-200
Growth and Fattening Pigs	100-150	200

NOTE: 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.

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 24 months.



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