overFerr·200

ANTIANEMIC
For use in pigs

over®

overFerr·200

IRON DEXTRAN
ZINC
COBALT
VITAMIN B12
SODIUM CACODYLATE

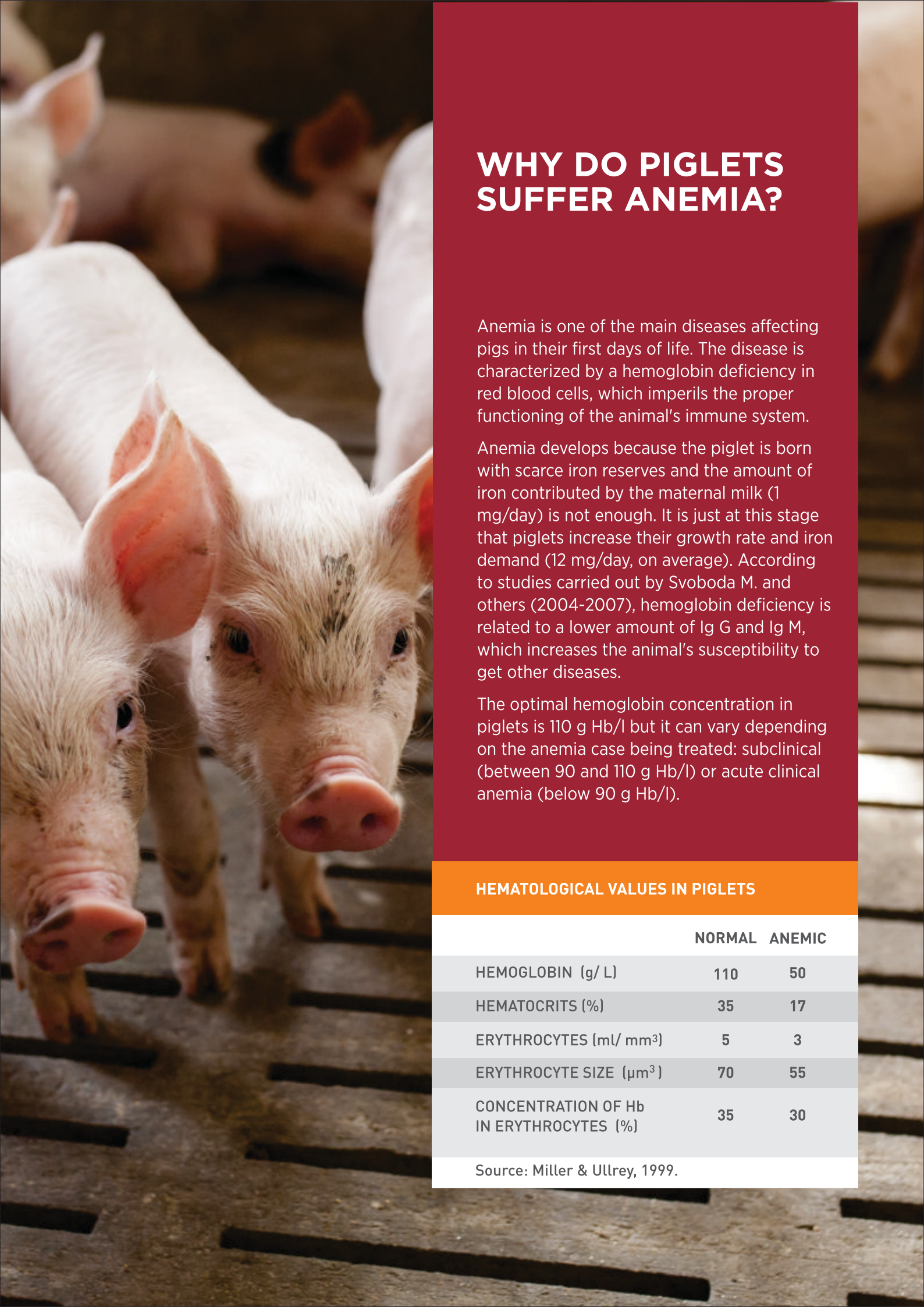
Since there is a close correlation between world meat production and consumption, trends in improving yields can be directly associated with consumption. According to international data, the average world consumption places pork first, followed by beef, poultry and, finally, sheep meat.

Today, piglets show genetic improvements resulting in a high productive performance, such as a high growth rate, a greater weight gain and a better feed conversion (Schwartz, 1990).

Therefore, piglets are born with body iron reserves (40 - 50 g) that are insufficient for the prevailing growth rate. Bearing in mind that a newborn piglet requires 12 mg of iron per day and is deprived of the natural iron source if raised on cement or slatted floors, its iron reserves cover only its first three days of life.

To make things worse, the dam only contributes 1 mg of iron per day to its piglet and this quantity does not cover the offspring's needs.

This situation inevitably leads to an iron-deficiency anemia. As a consequence, the need to implement systematic treatments with iron has become a routine practice in pig farms using intensive breeding systems.



WHY DO PIGLETS SUFFER ANEMIA?

Anemia is one of the main diseases affecting pigs in their first days of life. The disease is characterized by a hemoglobin deficiency in red blood cells, which imperils the proper functioning of the animal's immune system.

Anemia develops because the piglet is born with scarce iron reserves and the amount of iron contributed by the maternal milk (1 mg/day) is not enough. It is just at this stage that piglets increase their growth rate and iron demand (12 mg/day, on average). According to studies carried out by Svoboda M. and others (2004-2007), hemoglobin deficiency is related to a lower amount of Ig G and Ig M, which increases the animal's susceptibility to get other diseases.

The optimal hemoglobin concentration in piglets is 110 g Hb/l but it can vary depending on the anemia case being treated: subclinical (between 90 and 110 g Hb/l) or acute clinical anemia (below 90 g Hb/l).

HEMATOLOGICAL VALUES IN PIGLETS

	NORMAL	ANEMIC
HEMOGLOBIN (g/ L)	110	50
HEMATOCRITS (%)	35	17
ERYTHROCYTES (ml/ mm^3)	5	3
ERYTHROCYTE SIZE (μm^3)	70	55
CONCENTRATION OF Hb IN ERYTHROCYTES (%)	35	30

Source: Miller & Ullrey, 1999.

WHAT FACTORS PROMOTE THE DEVELOPMENT OF ANEMIA?

- Newborn piglets have low levels of **iron, zinc, sodium** and **vitamins B.**
- The contribution of these elements through the maternal milk is not enough.
- Intensive breeding is carried out on cement or slatted floors and the animals have no access to the soil.
- Exposure to stress.

WHAT ARE THE ANIMAL'S SYMPTOMS?

The most obvious symptom of anemia is the animal's growth retardation because the piglet reduces its appetite and desire to suckle. As a consequence, the following symptoms appear: paleness of the mucous membranes (particularly those corresponding to the ears and muzzle), coarse and abundant hair, hanging ears and tails, wrinkled and white skin, fatigue, indifference, and increased sensitivity to get other diseases. The animal may also experience severe breathing problems and decreased body temperature.

10%

UP TO 10% OF MORTALITY

WHAT ARE THE CONSEQUENCES OF ANEMIA?

The development of anemia in piglets has a direct influence on their well-being, as the disease reduces their growth and weight at weaning. All this results in significant economic losses for the breeder, due not only to the direct treatment costs incurred but also to the mortality rates (up to 10%) generated by the disease when it is not treated in due time.

-1,5 kg **UP TO 1.5 KG LESS AT WEANING**

WHAT IS OVERFERR 200?

OVERFERR 200 is an injectable formulation, specially developed to prevent and treat the iron-deficiency anemia in newborn pigs.

The formulation combines five selected active ingredients: **iron, vitamin B12, cobalt, zinc** and **sodium cacodylate.**

GMP

Good Manufacturing Pratices

OVERFERR 200 is produced under strict international quality standards (Good Manufacturing Practices) and has highly pure active ingredients.

COMPONENTS

VITAMIN B12

Vitamins are compounds necessary to maintain the metabolism and ensure the proper animal's development. Pigs require vitamins all along their productive stages. One of these important stages is the neonatal period, where vitamins are scarcely available in their bodies.
In particular, vitamin B12 is an essential nutrient to form red blood cells, regenerate tissues and make the body grow. This compound is indispensable for the erythrocytes to mature.

ZINC

Zinc is an essential component involved in several physiological functions. All animal species, but especially pigs, require great quantities of this mineral. Zinc is needed for both the calcification of bones and the production of hormones and insulin. In addition, zinc contributes to the immune system development because it is involved in the lymphocyte maturation and promotes the erythrocyte membrane stability.

COBALT

Cobalt is a fundamental component of vitamin B12. It is used by the pig's intestinal microflora to synthetize this vitamin. Regarding the treatment of ferropenic anemias, cobalt is involved in the iron metabolism as well as in the hematopoiesis by stimulating the reticulocytes.

SODIUM CACODYLATE

Sodium cacodylate is an inorganic arsenical salt showing a very low toxicity level and a high capacity to be assimilated. This compound stimulates the hematopoiesis and activates the formation of red blood cells. It also acts as an appetite stimulant, thus promoting the animal's growth.

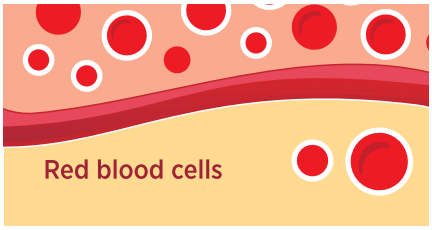
IRON

According to recent studies, one out of five piglets suffers from a clinical case of iron-deficiency anemia. In addition, up to 75% of the total litter has a deficient level of iron.

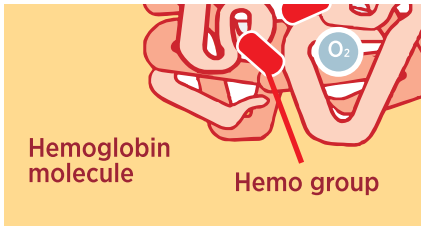
Iron is a fundamental element to achieve a good piglet development. This compound is an essential component in the formation of hemoglobin, which is a molecule located inside the red blood cells and responsible for maintaining both the oxygen transportation functions and the breathing activities.

In addition, this mineral plays an important role in the animal's immune system. Indeed, iron activates the enzymes involved in the inflammatory processes, and favors both the hyperplasia of leukocytes and the production of antibodies.

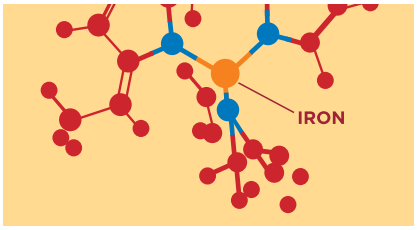
Iron also stimulates the secretion of hydrochloric acid in the stomach and favors the development of intestinal microvilli. These two actions contribute to the piglet's adaptation to consume solid food.



Each red blood cell contains hundreds of thousands of hemoglobin molecules that carry oxygen.



Oxygen bonds to the hemo group in the hemoglobin molecule.



Iron is the central part of the hemo group, which is the molecule needed for the formation of hemoglobin and the correct oxygenation of tissues.

TECHNICAL WORK

EFFECT OF OVERFERR 200, ALONE AND/OR COMBINED WITH A VITAMIN COMPLEX, IN THE PREVENTION OF IRON-DEFICIENCY ANEMIA

Vet. Gustavo Zimmermann
Vet. Diego Esborraz
OVER´s Technical Division

PURPOSE

1) To verify the effect of **OVERFERR 200 in** the prevention of the anemia caused by iron deficiency, through a hematocrit determination on each experimental piglet.

2) Analyze the incidence of **OVERFERR 200** in the animal's weight gain at weaning.

3) Evaluate the first two effects of **OVERFERR 200** under a treatment program where the antianemic is used alone or combined with a vitamin complex (HEMATOVER PLUS).

MATERIALS AND METHODS

PERIOD: October-November 2014.

PLACE: farm located in the Castellanos department, province of Santa Fe, Argentina.

Characteristics of the productive system: full cycle, confined and intensive breeding. At current, this system has 40 dams under production and foresees an increase of 140 dams for the incoming years.

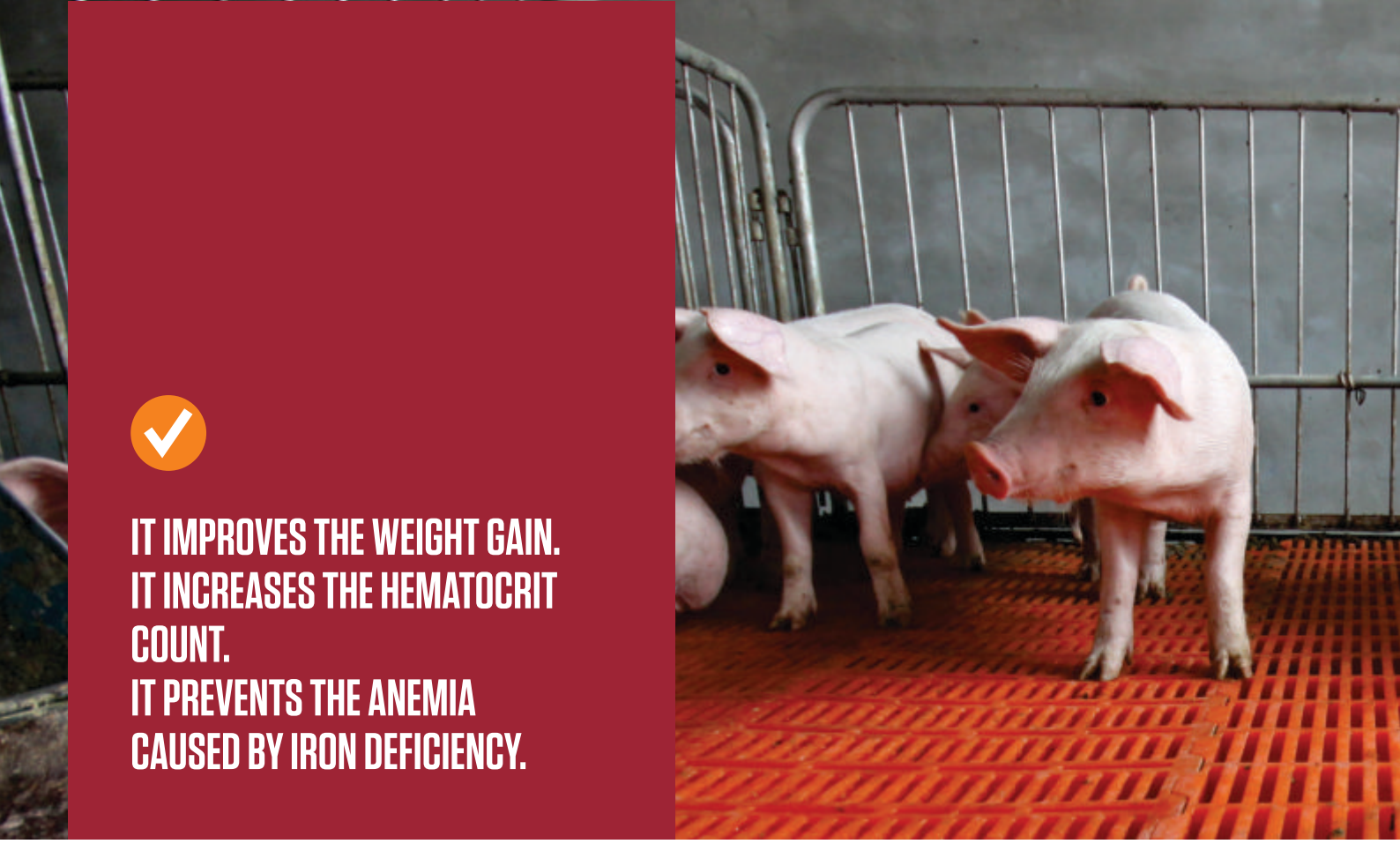
Six (6) dams with parturition dates comprised between 14 and 16 October 2014 were selected. The average number of live-born piglets per dam was 1 (one). The offsprings were individually weighed, identified according to the breeder's management system and randomly subjected to the following treatment scheme: two litters received three applications of **HEMATOVER PLUS** from the third day after birth, with an interval of two days between each application; another two litters received the combination of **HEMATOVER PLUS** and **OVERFERR**

HEMATOVER PLUS			
Dam N°14		**Dam N°16**	
Number of offsprings born alive	11	Number of offsprings born alive	12
Dosage	1 ml	Dosage	1 ml
Administration	IM	Administration	IM
Average weight at birth (k.l.w.)	1.4	Average weight at birth (k.l.w.)	1.3
HEMATOVER PLUS * + OVERFERR 200 **			
Dam N° 67		**Dam N° 85**	
Number of offsprings born alive	11	Number of offsprings born alive	11
Dosage	1 ml (*) and 1 ml (**) /10 k.p.v.	Dosage	1 ml (*) and 1 ml (**) /10 k.p.v.
Administration	IM	Administration	IM
Average weight at birth (k.l.w.)	1.3	Average weight at birth (k.l.w.)	1.4
OVERFERR 200			
Dam N° 15		**Dam N° 20**	
Number of offsprings born alive	12	Number of offsprings born alive	11
Dosage	1 ml	Dosage	1 ml
Administration	IM	Administration	IM
Average weight at birth (k.l.w.)	1.3	Average weight at birth (k.l.w.)	1.5

200 on the third day after birth, followed by two applications of **HEMATOVER PLUS** on the fifth and seventh day after birth.

Finally, two litters of 11 and 12 piglets received a dose of **OVERFERR 200** on the third day after birth. 1 ml of **HEMATOVER PLUS** was administered intramuscularly in the right leg. On the other hand, on the third day after birth, 1 ml of **OVERFERR 200** was administered intramuscularly in the left leg. Table 1 shows the number of offsprings, the treatments and the average initial weight at birth.

HEMATOVER PLUS Average weights for the litter						
Dam	14 October 2014		28 October 2014		11 November 2014	
	Individual	Total	Individual	Total	Individual	Total
N°24	1.2 kg	14.0 kg	5.0 kg	54.3 kg	6.6 kg	71.0 kg
N°26	1.3 kg	14.6 kg	5.4 kg	50.2 kg	6.4 kg	71.3 kg
HEMATOVER PLUS + OVERFERR 200 Average weights for the litter						
Dam	15 October 2014		29 October 2014		12 November 2014	
	Individual	Total	Individual	Total	Individual	Total
N°66	1.3 kg	16.3 kg	5.4 kg	53.9 kg	7.0 kg	75.0 kg
N°87	1.4 kg	15.2 kg	5.6 kg	56.0 kg	7.3 kg	74.8 kg
OVERFERR 200 Average weights for the litter						
Dam	16 October 2014		30 October 2014		13 November 2014	
	Individual	Total	Individual	Total	Individual	Total
N°13	1.3 kg	14.6 kg	4.4 kg	52.8 kg	5.9 kg	71.8 kg
N°22	1.5 kg	13.9 kg	4.6 kg	53.0 kg	5.7 kg	71.5 kg

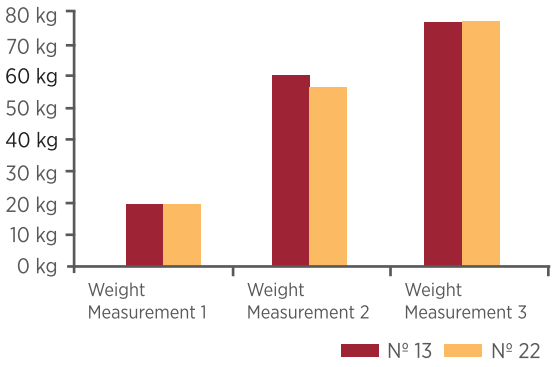


IT IMPROVES THE WEIGHT GAIN.
IT INCREASES THE HEMATOCRIT COUNT.
IT PREVENTS THE ANEMIA CAUSED BY IRON DEFICIENCY.

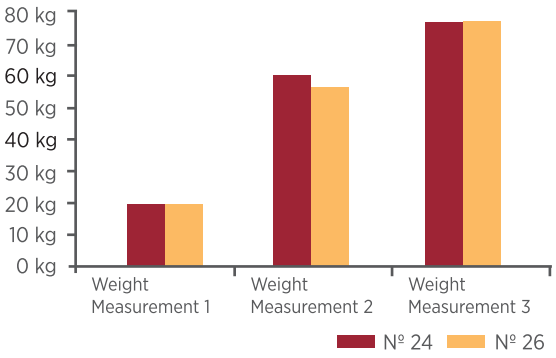
RESULTS

The animals subjected to the experimental conditions already described showed higher results in weight gain at weaning when the combination of **OVERFERR 200** and **HEMATOVER PLUS** was applied. On the other hand, the groups that received only **OVERFERR 200** or **HEMATOVER PLUS** did not show great differences in weight gain between them at the end of lactation. These results are summarized on Table 2 and its corresponding graphs.
The hematocrit count was significantly higher in the litters treated either with **OVERFERR 200** alone or with **OVERFERR 200** combined with **HEMATOVER PLUS** (see graph).

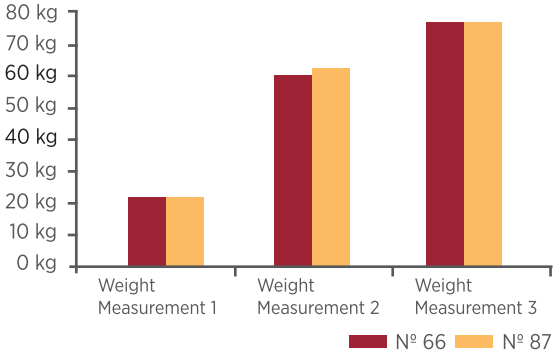
OVERFERR 200



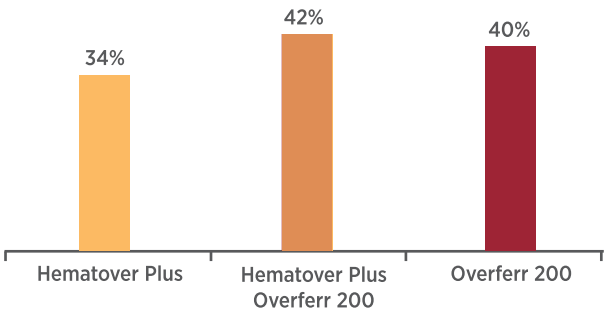
HEMATOVER PLUS



HEMATOVER PLUS + OVERFERR 200



AVERAGE VALUES FOR HEMATOCRITS



CONCLUSIONS

The combination of **HEMATOVER PLUS** and **OVERFERR 200** improved the weight yields at weaning, while the remaining groups obtained a better performance compared to the farm's average historical figures (see Table 2).
Regarding hematocrits, a better response was obtained when the combination of **HEMATOVER PLUS** and **OVERFERR 200** was used. However, the values corresponding to the litters that received only **OVERFERR 200** were notoriously higher compared to the values corresponding to the litters that received only **HEMATOVER PLUS.**
This experiment shows that **OVERFERR 200** (iron dextran, zinc, cobalt, vitamin B12 and sodium cacodylate) is an indispensable tool for the prevention of the anemia caused by iron deficiency. The possibility of combining **OVERFERR 200** with a vitamin complex **(HEMATOVER PLUS)** would encourage further improvements in the offspring's yields.

overFerr·200

Formula:
Every 100 ml, it contains:
Iron dextran..... 20 g
Vitamin B12 (cyanocobalamin).....0.0005 g
Cobalt chloride.....0.001 g
Zinc sulfate.....0.05 g
Sodium cacodylate.....0.3 g
Formulation agents.....q.s.

Indications of use:
Prevention of the iron-deficiency anemia in piglets.

Animal species to which it is intended:
Pigs.

Dosage:
1 ml/animal on the third day after birth.

Administration:
By intramuscular route.

over®
VETERINARY MEDICINE

OVER. Organización Veterinaria Regional S.R.L.
Veterinary Specialties Laboratory
Alfonsina Storni 680. (S2447). San Vicente. Santa Fe. Argentina
Tel. Fax: +54 (3492) 470696. labover@over.com.ar
www.over.com.ar