Introduction
Iron is an essential mineral for composition of blood cells, muscle and various enzymes and it is directly related to the cellular respiration of the body, as well as enzymatic reactions and immune cells in the animal organism (1). The current system of intensive pig farming deprives the animal's access to soil, the main natural source of iron supplementation for this species. In order to prevent iron deficiency anemia cases, it is recommended the application of dextran iron injection at the 3rd day of life of piglets. However, this management practice can bring a lot of inconveniences to the development of these animals. In the practice of human medicine for over 3 decades is made of iron supplementation with oral presentations (capsules and tablets) in order to prevent various types of anemia. One of the molecules of iron commonly used for this purpose is the carbonyl iron, due to its high content if organic iron available and high intestinal absorption (2). The purpose of this study was to evaluate the effectiveness of iron carbonyl orally in the iron supplementation in piglets.

Material and Methods
The experiment was conducted in a farm producing piglets in the state of Santa Catarina – Brazil. A total of 60 piglets (initially 1.95 ± 0.45 Kg) from 12 sows with same age and number of births and receiving the same management were used in this study. The experiment design was randomized blocks with 5 treatments and 12 repetitions, with each sow representing one experimental block. The treatments were: T1 – non iron supplementation, T2 – 2000mg dextran iron injectable the 3rd day, T3 – 150mg carbonyl iron orally the 3rd day, T4 – 200mg dextran iron injectable the 5th day; T5 – 150mg carbonyl iron orally the 5th day. No source of iron supplementation was used in addition to the treatments. The data were compared by Tukey test at a significance level of 5% for analysis of variance (ANOVA). The parameters evaluated were weight gain (at 21 and 57 days old) and blood parameters (hemoglobin, packed cell volume (at 21 days old).

Results
The evaluation of weight gain of piglets at 21 days of age showed a non-significant difference (P>0.05) among animals not supplemented and supplemented (dextran iron and carbonyl iron). However, analysis of blood parameters in the same period showed that piglets which did not receive iron supplements had lower (P<0.05) levels of hemoglobin (less 19.34%) and packed cell volume (less 18.37%) than those who received supplementation (dextran iron and carbonyl iron). Furthermore, piglets supplemented with dextran iron the 3rd day had higher (P<0.05) levels of hemoglobin (over 11.99%) and packed cell volume (over 9.25%) than those who received carbonyl iron on the same day, but they were similar (P>0.05) to piglets who received iron supplementation the 5th day (dextran and carbonyl). Even at 57 days of age, data analysis showed that the piglets non iron supplemented had lower (P<0.05) weight gain (less 10.31%) than those who received dextran iron supplementation the 3rd day. There was not difference (P>0.05) in weight gain of piglets according to the source of iron supplementation (dextran or carbonyl) and the timing of supplementation (the 3rd or 5th day).

Discussion
The data are consistent with (3), showing that piglets kept in intensive system of production and did not receive iron supplementation develop early iron deficiency anemia, evidenced by lower levels of hemoglobin and packed cell volume at 21 days old. However, the negative effect of livestock of iron deficiency in piglets may have a delayed response in relation to blood parameters, since the difference in weight gain among supplemented and non supplemented animals only became evident at 57 days old. The supplementation of carbonyl iron orally was shown to have a positive effect in preventing iron deficiency anemia in sucking piglets, and the administration the 5th day most appropriate. Even so, piglets supplemented with dextran iron the 3rd day had superior results for the blood parameters than piglets non supplemented and the supplemented with carbonyl iron.

References