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**A CASE OF IRON DEFICIENCY ANAEMIA IN TWO-WEEKS OLD  
PIGLETS IN EBONYI STATE, NIGERIA**

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**ABSTRACT**

*Two weeks old piglets in a farm at Ebonyi State, Nigeria, presented with clinical signs that included rough hair coat, swollen eye lids, emaciation, huddling together and pale mucous membranes. Haematological examination of their blood samples showed; packed cell volume 18%, red blood cell count  $3 \times 10^6$  mcl, haemoglobin concentration 7g/dl and white blood cell count  $10 \times 10^3$  mcl. A diagnosis of iron deficiency anaemia was made. Treatment with iron dextran that was repeated after ten days relieved the clinical signs and normalized the haematological values. In conclusion, the administration of iron-dextran successfully managed the condition of the piglets.*

*Keywords: Iron Deficiency Anemia, Piglets, Ebonyi State, Nigeria*

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**INTRODUCTION**

Iron deficiency anemia occurs frequently in pigs regardless of their breed. It is most prevalent during the neonatal period [1]. The pig is born with limited iron reserve; having a total body store of approximately 50 mg of Iron, mostly incorporated in hemoglobin [2]. Iron deficiency anemia occurs because the sow milk is a poor source of iron providing piglets with only 1 mg of iron a day [2] while daily iron requirement for piglet is about 7 mg [3,4,5]. Piglets lack access to soil, a rich source of Iron [2] due to confinement. In the first week of life, piglets double their weight and increase their plasma volume by 30%, thereby diluting the concentration of hemoglobin [6]. Iron deficiency leads to a reduction in immunocompetence, so that anemic piglets have reduced resistance to infectious and parasitic diseases [7]. This results in poor production, performance and considerable economic losses. With inadequate iron supplies in rapidly growing piglets, their ability to synthesize antibodies to overcome disease challenge is impaired. This is because iron is a key component in the enzymes used to produce antibodies. Iron-deficient and anemic pigs are more prone to diarrhea, often due to *Escherichia coli* infections, since they have suboptimal immunity [7]. Villous atrophy in the small intestine and alterations in gastrointestinal flora are found in iron-deficient and anemic piglets [7] which may also partially explain why these pigs are more susceptible to diarrhea.

## CASE HISTORY

On the 20<sup>th</sup> of November, 2017, a pig farmer in Abak, Akwa Ibom State, Nigeria complained of his piglets becoming thin, emaciated with swollen eyelids. He further complained of having lost 7 piglets out of 18 and 5 weaners out of 10. On farm visit, hygienic condition within the farm was apparently good. Some of the clinical signs noticed were raised hair coats, swollen eyelids, pale mucus membranes, emaciation, stunted growth, weakness and huddling.

## SIGNALMENT

The pigs in the farm were of Yorkshire breed and comprised of both sexes. There were 82 pigs in all made up of piglets, weaners, growers and adults. Out of these, 18 piglets aged 14 days were affected. They had a mean rectal temperature of 24.5°C.

## MATERIALS AND METHODS

### Blood Collection

Blood samples, were collected in sample bottles containing ethylene diamine tetra acetic acid (EDTA) as anticoagulant and sent to the Department of Animal Science Research Laboratory, Akwa Ibom State University, in Ikot Akpaden, Mkpato Enin Local Government Area for full blood count.

## RESULTS

### Clinical Signs

Raised hair coats, swollen eyelids, pale mucus membranes, emaciation, stunted growth, weakness and huddling due to chills. The results of the full blood count are shown in Table 1.

**Table 1. Blood analysis and their respective normal/reference values**

Parameter	Pre-treatment	Reference value [8]
PCV	18 %	32 – 50 %
RBC	$3 \times 10^6$ mcl	$5 - 8 \times 10^6/\mu$ L
Hb concentration	7 g/dl	10 – 16 g/dL
WBC	$10 \times 10^3$ mcl	$11,000 - 22,000 \times 10^3/\mu$ L

### Treatment

The affected piglets were treated with intramuscular injection of iron-dextran at 200 mg /Kg (2 ml/10 kg bwt) that was repeated 10 days later and multivitamin injection at 100 mg/Kg (1 ml/10 kg bwt) daily for three days. The pigs responded positively to the treatment with none showing further clinical signs of anaemia.

## DISCUSSION

The clinical signs seen in this case agree with previous reports that pigs that are anemic will appear pale in color (pallor) around the nose, eyes and mouth by 7 days of age and generally grow slower compared to piglets with sufficient iron [7,9]. In such situations, iron supplementation will be needed to reverse the condition [8,10]. Furthermore, previous reports suggest that single or double administration of iron-dextran can result in the recovery of affected animals. In this case, the administration of double dose of iron-dextran resulted in normal hemoglobin concentrations and recovery of 11 piglets and 5 weaners sick of iron deficiency anemia after 15 days. This treatment agrees with a previous report where the administration of iron-dextran (150 mg Fe) within eight hours of birth, followed by a second 150 mg Fe dose on day nine resulted in normal hemoglobin concentrations [11]. On the other hand, a single dose of

iron-dextran (200 mg Fe) was found to result in lower hemoglobin blood concentrations than the double-dose, although it was still successful in preventing iron deficiency anemia in the animals [11].

Preventive measures must be directed at the neonatal piglets because treatment of the sows before or after farrowing is generally ineffective. When indoor housing on impervious floors is necessary, iron should be provided at a rate of 15 mg/day until weaning either by oral dosing with iron salts of a commercial grade or by intramuscular injection of organic iron preparations. These methods are satisfactory, but the results are not usually as good as piglets raised outdoors [12]. For prevention, piglets should be injected in the neck rather than the hind limb at 1-3 days of age with at least 200 mg elements iron. Recently 200 mg in 1ml iron preparations given into the neck muscles when three weeks weaning is practiced and there is evidence that, when creep feed is available, only 100 mg is required [13]. Feeding sows a diet supplemented with 2000 mg/kg dry matter (DM) of diet will satisfactorily prevent iron deficiency anemia in piglets. The piglets ingest about 20 g of sow's feces per day, which will contain sufficient iron and obviate the need for intramuscular injection of iron- dextran. The piglets grow and thrive as well as those receiving the iron- dextran [13]. Recently soluble products for water medication have been used in piglet drinkers. In a few cases, farmers may wish to provide iron by including soil, peat or coal in the pen [13].



**Plate 1: Affected piglets with raised hair coat, stunted growth and swollen eyelids.**



**Plate 2: Piglets suckling, three weeks after treatment**

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