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Popular Article

Iron Supplementation and Piglet Anaemia

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Abstract

Piglets anaemia is observed in newborn piglets due to iron deficiency, mainly seen in intensive farms. Anaemia is categorized as microcytic and hypochromic anaemia. In acute cases there will be spasmodic breathing and, in severe situations, death can occur. In chronic cases, there will be paleness, wrinkled skin, pale ears and nose, rough hair coat, listlessness, and slow growth are observed. Because sow milk has a low iron content, iron supplements are necessary. From day 2 to day 31, iron supplements assist in raising the piglets' haemoglobin levels.

Keywords: Anaemia, Iron deficiency, Piglets, pre-weaning, symptoms, prevention.

Introduction

Iron deficiencies, both primary and secondary, in the early life of suckling piglets under intensive care are the cause of iron deficiency anaemia (IDA). The iron content of sow's milk is poor. The IDA is categorized as microcytic and hypochromic anaemia, with a decrease in haemoglobin (Hb) and red cell volume. Low level of hepatic iron storage before farrowing causes latent iron insufficiency in newborn piglets.

Piglets with sow

When the fetal growth peaks after the 70th day of pregnancy, reduced uteroferrin production results in iron deficiency (Bhattarai and Nielsen, 2015).

The formation of blood, the transportation of oxygen, and the production of energy all depends on iron. In piglets, iron-deficiency anaemia is a major issue. Sows' milk does not contain sufficient iron to meet the piglet's needs coupled with drastic drop of piglets' hepatic iron levels during the first week of life necessitates iron supplementation. Due to their fast growth and the resulting increase in plasma volume, the piglet needs a higher level of iron to maintain a healthy Hb level. Moreover, neonatal liver has a smaller storage of iron along with a lower iron content in milk, piglets kept in confinement need mineral supplements (Rincker *et al.*, 2004).

The piglets' body contains nearly 40 mg of iron at birth. Majority of the iron will be stored in the liver and present in the blood as haemoglobin. A normally growing newborn piglet's blood haemoglobin levels require roughly 7 mg of iron every day, therefore it's clear that internal stores won't last long without iron supplementation (Sarma, 2015).

Furthermore, sow's milk has a low iron content, and newborn piglets get relatively little iron from it. As a result, pigs who are not given iron supplements quickly develop iron deficiency anaemia (IDA). Piglets raised intensively are confined in pens where they are not in contact with earth, which exacerbates the anaemia (Meng *et al*., 2025).

A haemoglobin level of below 10 g/dL is indicative of anaemia. The normal range of Hb is 10–16 g/dL in sows. Hb level, on the other hand, tend to decrease in early lactation, when anaemia is more common, but they start to rise in late lactation. Hyperprolific sows were found to have a linear decline in average haemoglobin levels from 11.7 g/dL to 10.8 g/dL as parity increases. This implies that during the intervals between parities, the sows were unable to replenish their iron stores. Due to low iron storage and an increase in blood volume, mid-gestating sows receiving iron treatment at farrowing did not experience any change in hematologic variables in either sows or piglets (Noblett *et al.,* 2021)

Etiology of IDA in piglets

At birth, piglets have iron reserve of only 50 mg in liver. The body requires minerals and trace elements for growth and the liver's iron reserve starts to deplete immediately after birth. Piglets need 7–16 mg of iron daily for their faster growth, and iron storage is depleted in 3-5 days (Wilcock and Walk, 2016).

If the litter is large and since piglets grows quickly, the iron stores will get depleted very fast after birth. Because the animal isn't getting enough iron for growth and development, it might cause a serious iron deficit during the neonatal, weaning, or post-weaning phases and lower the survival rate of piglets (Kim *et al*. 2018).

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The sow's milk and colostrum doesn't contain enough iron for the newborns and they are more prone to iron deficiency anaemia. The range of iron levels is 1.4–2.6 mg/L in sow's milk. Even though the piglets need 7 mg of iron per day, they get only 1 mg of iron when they consume 0.5–1 liters of milk. Individual piglets' access to milk and iron declines with litter size, and excessive milk production may result in decreasing milk iron levels (Stojanac *et al.*, 2016).

Piglets raised on commercial farms are not exposed to dirt, which is a natural supply of iron, hence it was demonstrated that litters housed in concrete cages were more likely to develop anaemia in the second or third week of life (Pal and Chakravarty, 2020).

Pathogenesis

Healthy newborn piglets have blood haemoglobin levels of about 10g/dl. On the other hand, around 40% of piglets have latent iron insufficiency, and their haemoglobin and transferin-bound plasma iron (TBPI) levels fluctuate substantially. During the first week or two weeks after birth, piglets' blood haemoglobin levels may fall below 4-5 g/dl if they are not given iron supplements. Erythropoietin activity increases two to six times in these piglets after receiving subcutaneous injections of iron preparation over the course of 24 to 48 hours (Fjelkner *et al.*, 2024).

Pigs are having six-layer epitheliochorial diffuse type placenta. The uteroferrin, a protein synthesized and secreted by the glandular epithelial cells of the maternal uterus of the pig is involved in iron transport to the fetus. The level of uteroferrin rapidly decreased after 70 days of pregnancy. Hence, the rate of iron transfer from maternal to fetal tissue will be considerable reduced. Because of this there will be negligible effect in supplementing pregnant sows' diets with iron to avoid piglet anaemia, that develops two to three days after farrowing. Nonetheless, the amount of haemoglobin in the piglets at birth is increased when iron is given intravenously to sows in the later stages of pregnancy (Sharma, 2009).

Risk factor (Roy *et al*., 2018)

1. The piglet’s mortality due to anaemia occurs within the first few days of their lives. 90% of pre-weaning deaths takes place within one week of farrowing, and 50% of all deaths happens during the first 3 days of life.
2. Both native and exotic breeds of female piglets had higher mortality rates.
3. The biggest death rate was seen in piglets between the ages of 0 and 15 days
4. (6.94%).
5. The highest fatality rate is observed during the winter, followed by the wet and spring seasons.

Clinical Signs (Killeen *et al.*, 2025)

Iron deficiency anaemia has different stages, such as acute anaemia and chronic anaemia:

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a) Acute anaemia: Spasmodic breathing and, in severe situations, death are symptoms.

b) Chronic anaemia: Paleness, pale ears and nose, wrinkled skin, rough hair coat, slow growth rate, and listlessness, fluid accumulation around oesophagus, interior body spaces, brisket, and diarrhoea, are observed before death.

Treatment and Prevention

Parenteral iron supplementation: The two iron-containing products, gleptoferron iron, and iron dextran can be used to avoid IDA in nursing piglets. This can improve the piglets' Hb levels from day 2 to day 31 (Sperling *et al*., 2018).

During the late gestation and lactation phases, adding 25g/100kg of FerroCom to the sow's diet improved the heamato-biochemical levels of the piglets from birth to weaning. The prevention of iron deficiency anaemia in piglets, however, may be achieved by supplementing the diet of sows with FerroCom at a rate of 25g/100 kg feed throughout the late gestation and lactation periods, and then giving pre-weaned piglets 7.5 ml of FerroCom syrup daily until they are ready to be weaned (Nath *et al.*, 2015).

An external iron supply, which can be injected intramuscularly or subcutaneously, is required to treat IDA. An iron injection given to newborn piglets within 24 hours lead to a greater growth rate at weaning than piglets that were not treated, suggesting that early iron treatment may accelerate growth. Iron dextran complex is a 20% injectable form of iron dextran used to treat and prevent swine anaemia. Piglets typically receive 200 mg of iron per day during the first few days of their lives, but occasionally this is insufficient for their rapid growth, necessitating a second dose in the 3rd or 4th week age (Peters and Mahan, 2008).

Prevention

Piglet iron can be given orally in a variety of ways. The piglets will naturally obtain iron from soil because it is the main source of iron. On the other hand, regularly adding soil to the pen is a time-consuming process. Iron absorption by nursing piglets can also be facilitated by painting the sow's udder with a saturated ferrous sulphate solution for four to six weeks during lactation. For the prevention and management of IDA, the nursing piglets may be administered iron salts along with syrups (Friendship *et al*., 2021).

Conclusion

Piglet anaemia due to iron deficiency in piglets occur during pre-weaning age, and piglet anaemia is a major problem among the piglets. All the factors cannot be controlled, but understanding them and taking proper care and management practices, and iron supplementation, will assist the farmers and producers in minimizing death loss. Therefore, proper health care programme and

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management practices must be chalk out in advance to prevent the huge economic losses in pig farms due to piglet anaemia.

References

Bhattarai, S. and Nielsen, J. P. (2015). Early indicators of iron deficiency in large piglets at weaning. *Journal of Swine Health and Production*, *23*(1), 10-17.

Fjelkner, J., Sannö, A. and Emanuelson, U. (2024). Iron status in piglets at three days of age and at weaning and possible seasonal effects on the blood haemoglobin levels in a Swedish outdoor pig-producing farm. *Acta Veterinaria Scandinavica, 66*(1), 13.

Friendship, R., Seip, V. and Amezcua, R. (2021). A comparison of 4 iron supplementation protocols to protect suckling piglets from anaemia. *The Canadian Veterinary Journal, 62*(1), 55.

Killeen, R. B., Kaur, A. and Afzal, M. (2025). Acute Anaemia. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan–. PMID: 30725917. https://www.ncbi.nlm.nih.gov/books/NBK537232/ Accessed on 06/06/2025

Kim, J. C., Wilcock, P., and Bedford, M. R. (2018). Iron status of piglets and impact of phytase super dosing on iron physiology: A review. *Animal Feed Science and Technology*, *235*, 8-14.

Meng, Q., Wu, Q., Zhou, Q., Tang, J., Zhuo, Y., Fang, Z. and Che, L. (2025). Impact of Iron Supplementation on Growth Performance, Iron Homeostasis and Redox Balance of Suckling Piglets. *Animals, 15*(7), 924.

Nath, M., Nath, D. R. and Mahanta, P. N. (2015). Prevention and control of piglet Anaemia by oral supplementation of ferrocom in sows and their piglets. *Asian Academic Research Journal of Multidisciplinary, 1*(30), 523-527.

Noblett, E., Ferriera, J. B., Bhattarai, S., Nielsen, J. P. and Almond, G. (2021). Late gestation haemoglobin concentrations in sows: Predictor for stillborn piglets. *Journal of Swine Health and Production, 29*(4), 200-203.

Pal, A. and Chakravarty, A. K. (2020). Major diseases of livestock and poultry and problems encountered in controlling them. In: Genetics and Breeding for Disease Resistance of Livestock, Academic Press, pp 11-83.

Peters, J. C. and Mahan, D. C. (2008). Effects of neonatal iron status, iron injection at birth, and weaning in young pigs from sows fed either organic or inorganic trace minerals. *Journal of Animal Science*, *86*(9), 2261-2269.

Rincker, M. J., Hill, G. M., Link, J. E. and Rowntree, J. E. (2004). Effects of dietary iron supplementation on growth performance, hematological status, and whole-body mineral concentrations of nursery pigs. *Journal of Animal Science, 82*(11), 3189-3197.

Roy, R., Mondal, T. and Moktan, M. W. (2018). Patterns of pre-weaning piglet mortality and economic losses in field condition. *African Journal of Agricultural Research, 13*, 1291-1296.

Sarma, D. K. (2015). Iron Deficiency Anaemia or Piglet Anaemia. https://www.kiran.nic.in/pdf/publications/mizoram/piglet_anamia.pdf Accessed on 06/06/25

Sawhney, S., Sarkar, G., Begum, S. and De, A. (2023). Iron deficiency anaemia in piglets and molecular mechanisms involved in iron metabolism: a review. *Indian Journal of Animal Health*, *62*, 47-58.

Sharma, N. (2009). Clinical Veterinary Medicine. New India Publishing. https://books.google.co.in/books/about/Clinical_Veterinary_Medicine.html?id=gH0URy8r6ngC&redir_esc=y Accessed on 06/06/25

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Sperling, D., Freudenschuss, B., Shrestha, A., Hinney, B., Karembe, H. and Joachim, A. (2018). Comparative efficacy of two parenteral iron-containing preparations, iron gleptoferron and iron dextran, for the prevention of anaemia in suckling piglets. *Veterinary Record Open, 5*(1), e000317.

Stojanac, N., Stevančević, O., Cincović, M., Belić, B., Plavša, N. and Urošević, M. (2016). Effects of iron administration method on anaemia prevention and production performance of piglets. *Acta Scientiae Veterinariae, 44*, 1-8.

Szudzik, M., Starzyński, R. R., Jończy, A., Mazgaj, R., Lenartowicz, M. and Lipiński, P. (2018). Iron supplementation in suckling piglets: an ostensibly easy therapy of neonatal iron deficiency anaemia. *Pharmaceuticals*, *11*(4), 128.

Wilcock, P. and Walk, C. L. (2016). Low phytate nutrition–what is the pig and poultry industry doing to counter dietary phytate as an anti-nutrient and how is it being applied. Phytate destruction-consequences for precision animal nutrition, pp. 87-106.