

Improved health, welfare and viability in young pigs: oral iron supply in neonatal piglets to avoid anaemia

Description

Piglets have low iron stores at birth, but their iron requirements are high due to rapid growth. Sow milk is poor in iron, but piglets in their natural environment find sufficient iron in the soil. Therefore in most outdoor systems iron supplementation is not necessary.

For piglets reared indoors with or without an outdoor run, iron provision is required from about three days after birth to prevent any risk of anaemia.

Most commonly, an intramuscular or subcutaneous injection of iron is used. Oral supply is also possible and is administered in the form of a paste directly into the mouth of the piglets on a few consecutive days. Another option is to distribute a powder enriched in ferrous salt in a piglet trough for a couple of weeks.

Iron supplementation products need to be certified for organic agriculture. Otherwise, peat, soil or other substrates naturally rich in iron, e.g. composted river mud, used as a renewable alternative to peat, can be distributed daily during the lactation period, provided they are free from pathogens.



Iron supplementation is necessary soon after birth to prevent any risk of anaemia during the first weeks of life. The iron-rich powder or peat needs to be accessible to the piglets but not to the sow.

Applicability box

Theme

Pigs

Farm type

Indoor housing with or without outdoor run and pasture access

Production stage

Sows + piglets

Welfare Environment Cost



Legislation

- The EU organic Regulations 2018/848 and EU 2020/464 allow ferrous carbonate, ferrous sulphate and ferric oxide as nutritional additives.
- Apart from vaccinations, treatments to prevent suffering at castration and against parasites, only one chemical allopathic veterinary treatment is authorised in the life of a growing-finishing pig. If certifying bodies consider the injection of iron as an allopathic treatment, as is the case e.g. in France oral solutions must be preferred.

Relevance for animal welfare

Anaemia leads to a decreased production of red blood cells, impaired immune function and growth, and is, therefore, a major issue for the piglets' health and welfare. When supplying iron by injection, stressful handling of each piglet is unavoidable. Furthermore, dosing is not easy. Most frequently, a single dose of 200 mg is used. Iron is then stored in the liver, but storage may become insufficient 3-4 weeks after the injection. Still, the dosage should not be increased, as high amounts of iron in one dose may favour oxidative stress and play a role in inflammatory processes like arthritis.

The advantage of oral iron supply for several weeks is, that the gut regulates iron absorption precisely per the piglet's needs. Furthermore, the supply of small quantities of a highly appetising feed or peat acts as environmental enrichment for piglets and helps them learn how to eat solid food.

Relevance for environmental impact

- The environmental cost for producing and packing iron supplements has not been studied, but the impacts per piglet will be low due to the small dose per piglet. Furthermore, the iron that the piglet's gut has absorbed is not excreted into the environment through urine or faeces.

Cost and labour

- Iron treatment is inexpensive.
- Oral supplementation of iron is more time consuming than injection, since it is repeated daily over one or several weeks.



The innate curiosity of piglets leads them to learn quickly to consume small amounts of the iron supplemented product. The addition of this palatable product in the pen also facilitates the learning of solid food consumption.

Recommendations / requirements

- **How much to provide:** In free-range systems, no iron supplementation is needed unless soils are abnormally poor in iron. Indoors, piglets should be supplied by intramuscular injections (200 mg of iron), orally by a paste (two doses of 100 mg of iron are recommended), by voluntary intake of a commercial ferrous powder distributed on top of peat (following the supplier's dosage recommendations), or by voluntary intake of a natural substrate containing iron like soil or peat and distributed daily in a trough (start with 15 g, and increase progressively until 25 g / piglet per day).
- **How to stimulate voluntary intake:** Peat, soil or powder containing iron should be fresh and hence supplied daily in a trough distinct from the one used for feed. The trough with iron supplement must be located close to the heating lamp and inaccessible to the sow.
- **How to prevent risk of iron deficient piglets:** Individual piglets that are pale or litters with low spontaneous oral intake of iron supplement should be supplied with iron, either by gavage with an oral paste or by injection.
- **What to do in case of diarrhoeic episodes on the farm:** In case of diarrhoea, the iron intake by the gut may be decreased. Additionally, the iron present in the digestive tract can be used by the present microorganisms, especially by gut pathogens, for their own growth. Therefore, the injection route should be preferred to oral supplementation.

Further information

- **EU (2018):** Regulation (EU) 2018/848 on organic production and labelling of organic products. At: eur-lex.europa.eu [Link].
- **EU (2020):** Commission Implementing Regulation (EU) 2020/464 of 26 March 2020 laying down certain rules for the application of Regulation (EU) 2018/848. At: eur-lex.europa.eu [Link].
- **Prunier A. et al. (2021):** Assessment of iron supplementation in organic piglets. 53d Swine Days' Research, 53, 405-410.
- **Svoboda M. et al. (2017):** Parenteral iron administration in suckling piglets – a review. Acta Veterinaria Brno, 86, pp. 249-261 [Link].
- **Svoboda M., Píšířková K. (2018):** Oral iron administration in suckling piglets – a review. Acta Veterinaria Brno, 87, pp. 77-83 [Link].

Imprint

Publisher:

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Permalinks: orgprints.org → [power](https://power.projects.au.dk), projects.au.dk → [power](https://power.projects.au.dk)

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The project 'POWER - Proven welfare and resilience in organic pig production' is one of the projects initiated in the framework of Horizon 2020 project CORE Organic Co-fund (<https://projects.au.dk/coreorganiccofund/>) and it is funded by the Funding Bodies being partners of this project (Grant Agreement no. 727495). The opinions expressed and arguments employed in this factsheet do not necessarily reflect the official views of the CORE Organic Co-fund Funding Bodies or the European Commission. They are not responsible for the use which might be made of the information provided in this factsheet.



