

Oral alternatives for intramuscular iron administration in suckling pigs

Sophie Goethals

Karolien Hertogs, Kobe Buyse, Katrijn Hooyberghs
Nadine Buys, Steven Janssens, Jef Van Meensel, Sam Millet

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Standard: intramuscular injection of iron complexes

Mostly: single parenteral injection of iron dextran (200 mg Fe³⁺)



laborious, time consuming, injection site reactions, risk of disease transmission, risk for overdosing



under discussion in organic pig farming



Alternatives?

- Through sow's diet
- Oral route: via drinking water, oral iron paste or feed

Options: different iron sources, forced versus voluntary intake



Comparison of standard iron injection with different methods of oral iron supplementation on



Iron status (hemoglobin levels at weaning)



Growth performance (during lactation, post-weaning and long-term effects)



Carcass quality

5 treatments



- 1) IM: intramuscular injection at d3
1 mL of a 200 mg/ml iron dextran complex

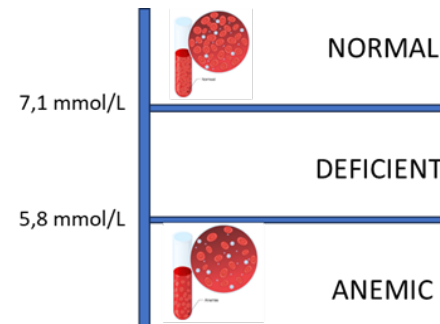
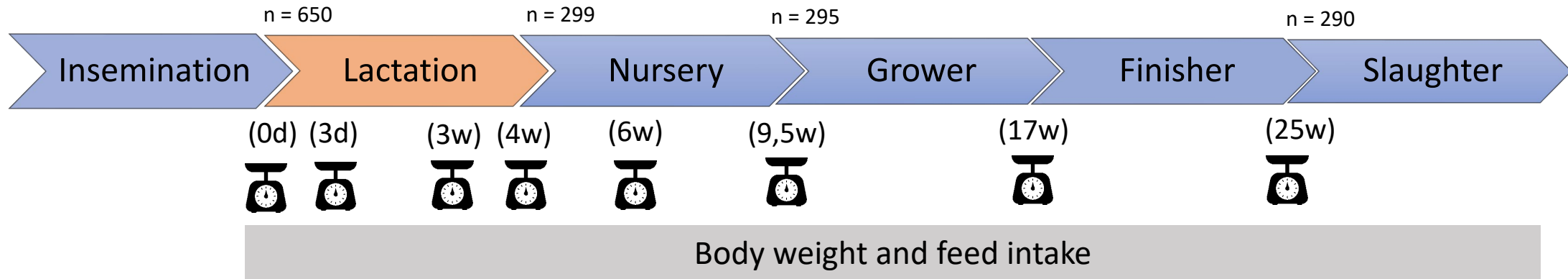


Ad libitum access
to O1, O2 and O3
between d3-d12

- 2) O1: mineral powder (Lava rock dust, Orgamé)
10-12% Fe_2O_3
- 3) O2: Farmafer (Farm'apro)
22.5% ferrous sulphate
- 4) O3: Hemoral (Agro Logic)
24% iron in a mixture of ferrous fumarate, ferrous glycine chelate, ferrous amino acid chelates and ferrous sulphate
- 5) O3 APPLE: blend of Hemoral with applesauce (1:2 ratio)
individually administered via a syringe at d3, d5, d7, d10, and d12 to provide each piglet ± 10 g of Hemoral in total



650 piglets from 46 litters; 9 (or 10) litters/treatment

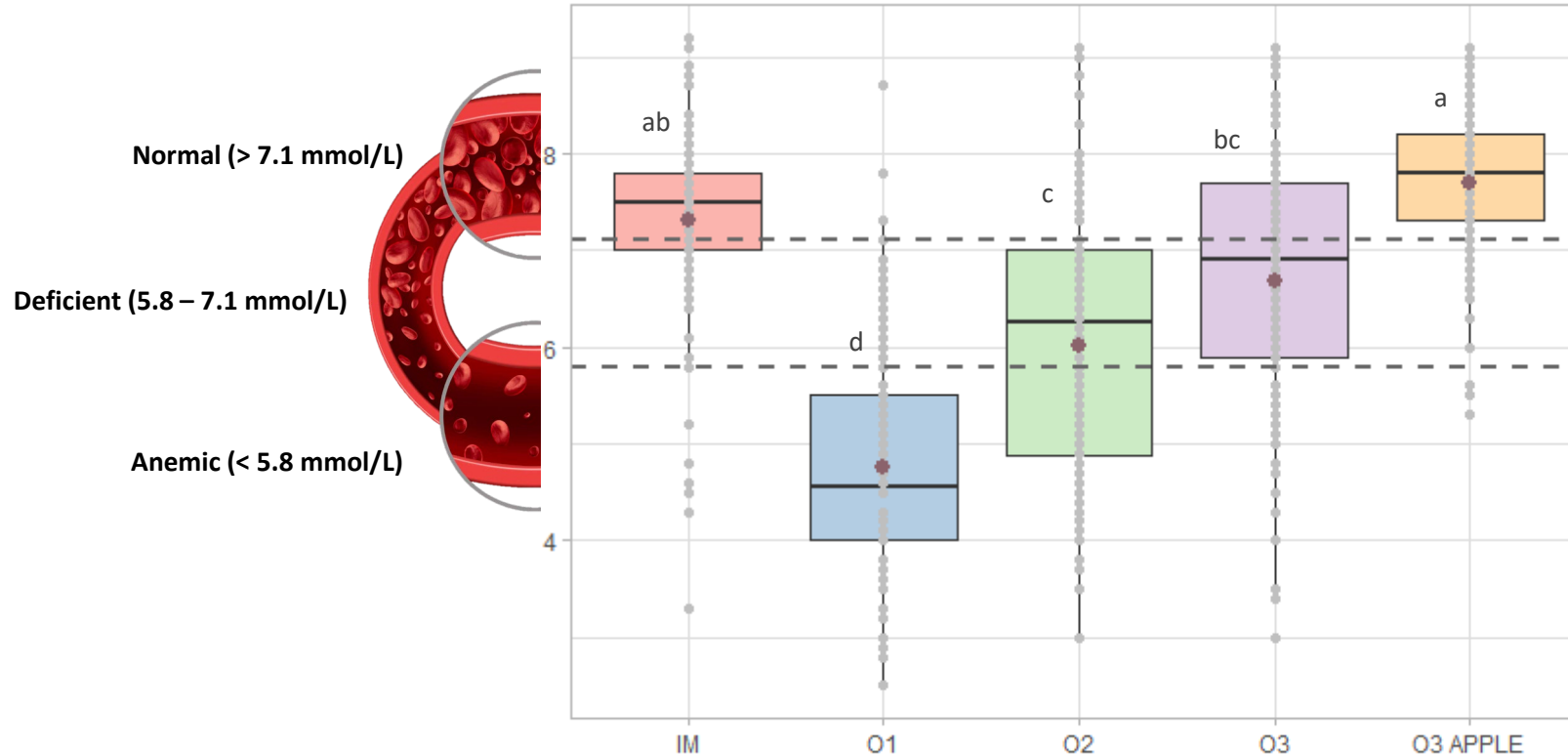


Carcass data

No clear association between iron supplementation and mortality during lactation

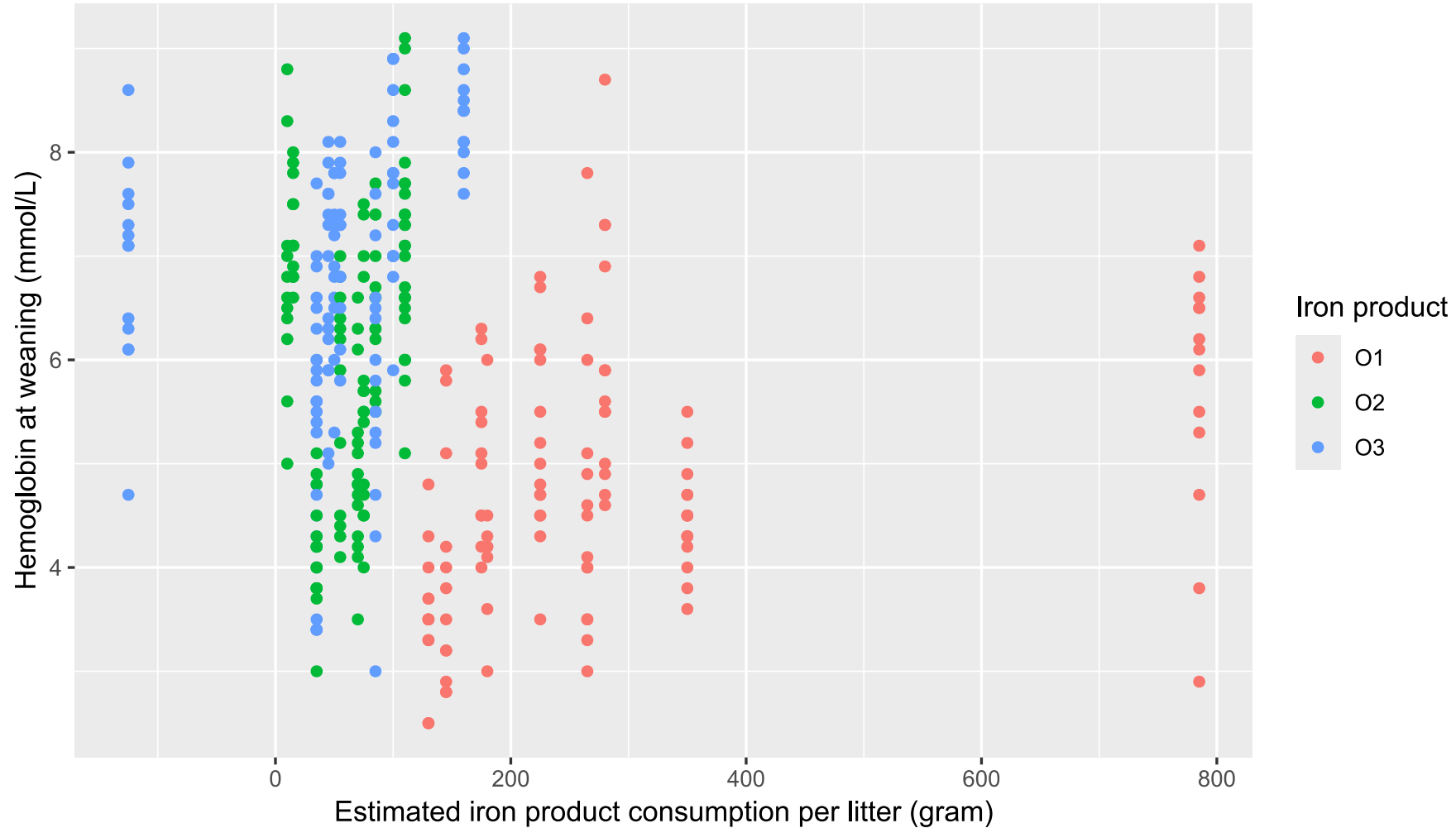
number of piglets	born alive	weaned	died
Intramuscular injection	128	119	9
O1	123	116	7
O2	128	120	8
O3	127	118	9
O3 apple	144	135	9
total	650	608	42

Hemoglobin level (mmol/L) at weaning



	IM	O1	O2	O3	O3 APPLE
<i>n</i>	119	112	119	116	134
Normal (%)	68.9	3.6	19.3	43.1	79.1
Deficient (%)	26.1	20.5	39.5	35.3	18.7
Anemic (%)	5.0	75.9	41.2	21.6	2.2

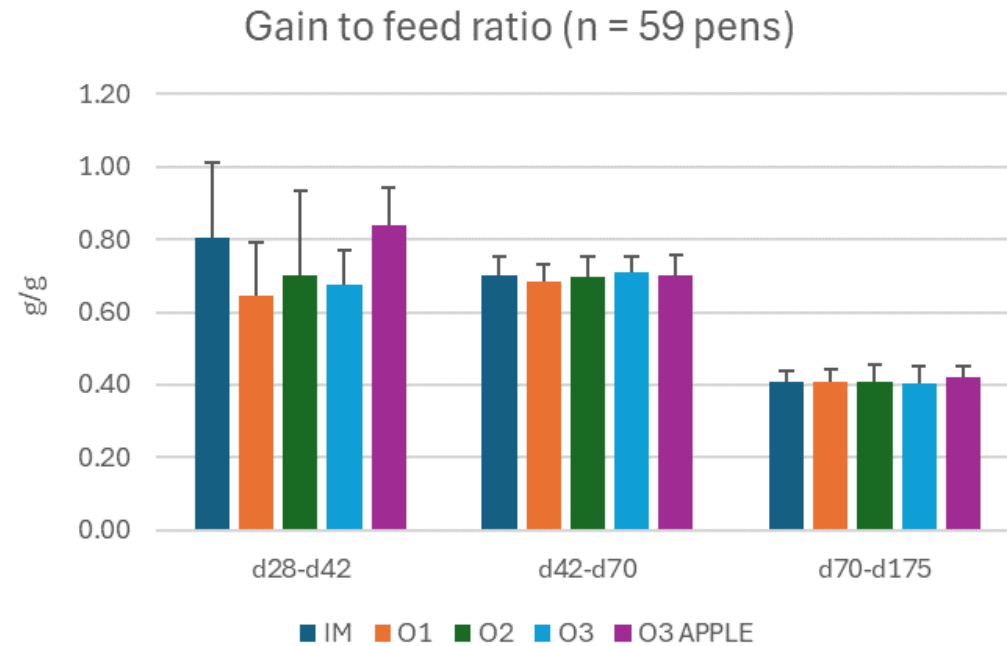
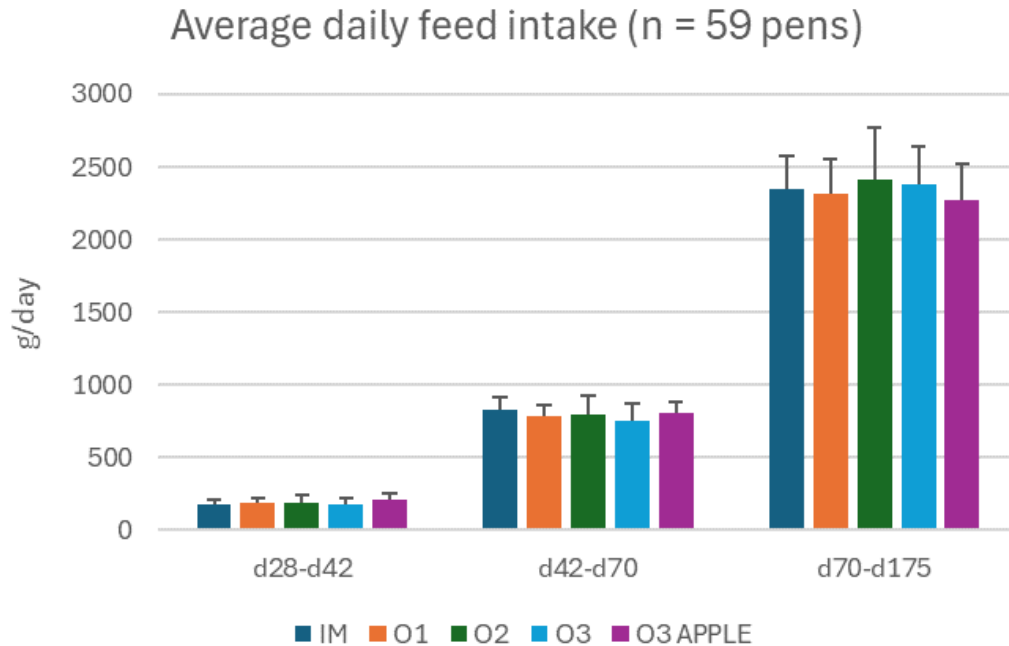
Hemoglobin level was not related to “iron intake”



Growth performance was minimally affected

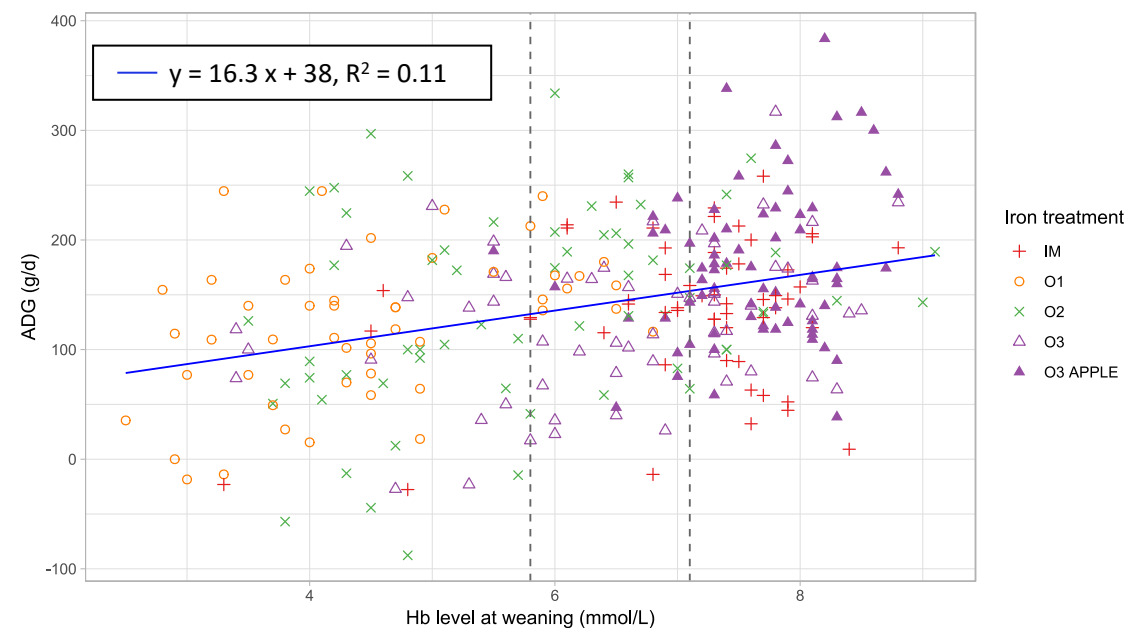
		IM	O1	O2	O3	O3 APPLE	p-value
BW (kg)							
d28 (<i>n</i> = 600)		8.0	7.7	7.4	8.1	8.0	NS
d70 (<i>n</i> = 299)		25.8	24.5	24.9	24.3	25.7	NS
d119 (<i>n</i> = 295)		70.0	67.6	69.8	68.2	69.5	NS
Final weight, d175 (<i>n</i> = 295)		121.6	118.4	121.4	120.0	120.5	NS
Average daily gain (g/d)							
Lactation	d0-d28 (<i>n</i> = 600)	238	230	217	240	232	NS
	d21-d28 (<i>n</i> = 600)	298	287	262	312	293	NS
Nursery	d28-d70 (<i>n</i> = 299)	438	407	432	404	438	NS
	d28-d42 (<i>n</i> = 299)	137 ^{ab}	122 ^b	139 ^{ab}	125 ^b	176 ^a	0.025
	d42-d70 (<i>n</i> = 299)	578	540	571	532	560	NS
Grower - finisher	d70-d175 (<i>n</i> = 295)	959	935	969	956	953	NS
	d70-d119 (<i>n</i> = 295)	889	863	904	883	880	NS
	d119-d175 (<i>n</i> = 295)	1027	1006	1032	1027	1025	NS

Feed intake and feed efficiency were not affected

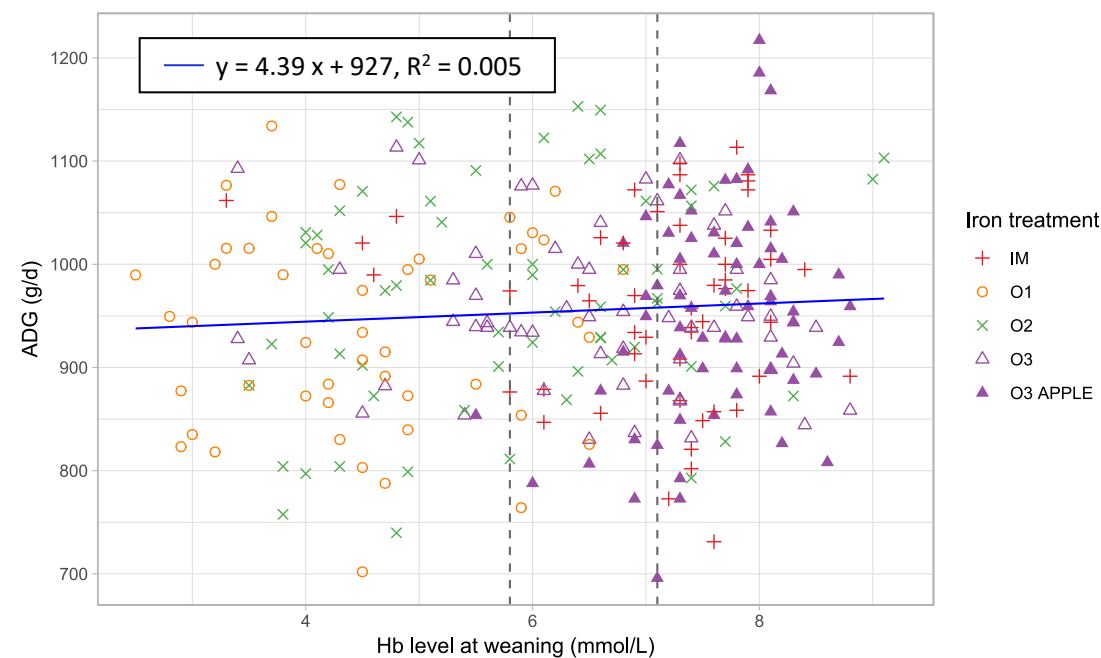


Association between iron status & growth performance

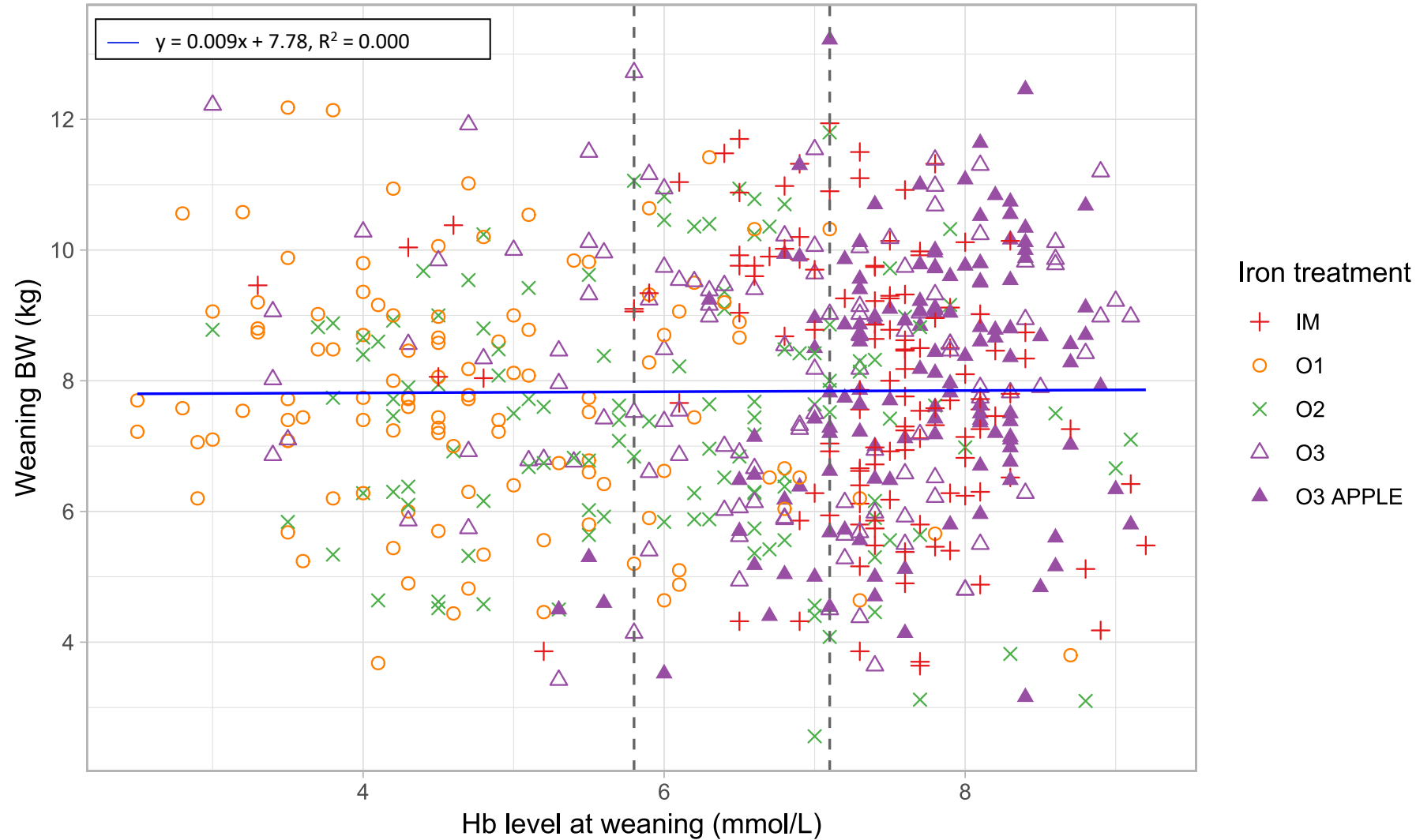
Early post-weaning (d28-42)



Grower and fattening (d70-175)



No association between iron status and weaning BW



No effect on carcass quality

	IM	O1	O2	O3	O3 APPLE	p-value
Cold carcass weight (kg)	92.6	90.8	93.8	91.8	93.0	NS
Dressing yield (%)	79.7	79.7	79.6	79.1	79.5	NS
Lean meat content (%)	62.9	63.1	62.2	62.2	62.8	NS
Daily lean meat gain (g/d)	460	455	469	456	465	NS

Conclusion

Can orally administering iron achieve an iron status comparable to that achieved by standard injection?

Yes, the administration of hemoral (O3) through voluntary or forced intake resulted in Hb levels comparable to those achieved with the standard injection.

What is the effect of iron treatments and hemoglobin levels on growth performance and carcass quality?

Except for the early post-weaning period, growth performance and carcass quality were not affected by the iron treatments or hemoglobin levels.



Thank you!

