

The economics of iron deficiency anemia on swine production

Chris W. Olsen

Pharmacosmos Inc. Watchung, NJ USA

INTRODUCTION

- Studies have shown that up to 79% of baby pigs have less than optimal blood hemoglobin (Hb) at weaning^{1,2}
- Previous studies with Uniferon[®] have shown that a baby pig's Hb concentration at weaning impacts wean-finish growth rates²
- The objective of this study was therefore to evaluate the economic impact of iron deficiency anemia on swine production in the United States

MATERIALS AND METHODS

- Hb was measured at the time of weaning in 235 healthy baby pigs and classified according to Table 2A
- Each pig was weighed individually at weaning and again at 131 days post-weaning
- A linear regression model was fit using Hb status at weaning as a predictor of wean to finish ADG with wean weight and sex as covariates
- The regression equation was used to estimate how Hb distribution impacted wean-finish ADG and considered the following (Table 2B):
 - Hb distribution of a herd when given a single 200 mg dose of Uniferon[®] was used as a baseline
 - Hb distribution resulting from administration of a second 200 mg dose of Uniferon[®] by 12 days of age
 - Estimates were included to account for costs of production, product, and, labor for administration a second injection of Uniferon[®]

Table 2. Economic impact of iron deficiency anemia on United States swine production using a fixed-days marketing strategy

A. Model inputs			
Hb status at weaning*	200mg iron	400mg iron	
Optimal	21 %	70 %	
Sub-clinical	54 %	27 %	
Deficient	25 %	3 %	
Wean-finish days on feed		165	
2nd injection (product and labor)		\$ (0.25)	
Carcass yield (%)		76	
Lean hog price/cwt ³		\$ 80.37	
B. Economic return of improved hemoglobin status at weaning			
Wean-finish average daily gain (lbs) [†]	1.587	1.617	
Weight at marketing (lbs)	261.8	266.8	
Weight difference per head		5.0	
Net return on investment per head		\$ 3.06	
Total hogs slaughtered in the US ⁴		121,317,200	
Annual impact on US swine production		\$ 340,591,525	

*Expected hemoglobin distribution at weaning in baby pigs receiving a single 200 mg dose of Uniferon[®] or two 200 mg doses of Uniferon[®] by 12 days of age

[†] Estimated using the regression equation $ADG = 1.158259 + (0.063996 * Optimal.Hb) + (0.003783 * SubClinical.Hb) + (0.034634 * WeanWeight) - (0.074726 * \%female)$

RESULTS AND CONCLUSIONS

- Data from this and previous studies clearly show that a single 200 mg dose of injectable iron is not sufficient in preventing full-scale and sub-clinical iron deficiency anemia in baby pigs
- This model shows a tremendous economic potential remains untapped by failing to maximize the hemoglobin status of baby pigs at weaning
- Injectable iron products are Non Biological Complex Drugs and even small changes in the manufacturing process can lead to changes in their clinical profile. Even for products of the same generic name, efficacy and safety may differ.⁵ The conclusions in this study only apply to Uniferon[®]
- This analysis indicates that the implementation of a second injection of iron to treat anemia can lead to productivity gains of:
 - United States: \$2.77 USD per head corresponding to a > \$300M USD opportunity for the industry
 - European Union: €2.08 per head corresponding to a > €530M opportunity for the industry⁶

REFERENCES

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