

# Effect of Increasing Gleptoforte Dosage in Newborn Pigs on Sow and Litter Performance

S. Newton, H. Williams, MS; J. DeRouchey, MS, PhD.; J Woodworth, MS, PhD.; M. Tokach, MS, PhD.; S.S. Dritz, MS, PhD., DVM; R. Goodband, MS, PhD.; A. Holtcamp, DVM.

Department of Animal Sciences and Industry, Kansas State University, Manhattan, KS; Department of Diagnostic Medicine/Pathobiology , College of Veterinary Medicine, Kansas State University, Manhattan, KS; Ceva Animal Health, LLC., Lenexa, KS

## Introduction

- Newborn piglets are more susceptible to iron deficiency due to inadequate iron stores at birth and rapid growth rate before weaning which can cause decreased number of circulating red blood cells, lethargy, and mortality.
- The injection of 200 mg of iron is commonplace in the swine industry at time of piglet processing. This iron injection results in improved growth rate and iron status of piglets, but there is some concern over the level provided with one injection as opposed to giving a booster before weaning.
- Gleptoforte is an injectable iron that contains Gleptoferron and is utilized to prevent anemia in newborn piglets.
- Little data is available that confirms the appropriate level of iron injection needed with modern genotypes.

## Objective

- To evaluate the effects of increasing dosage of Gleptoforte in newborn pigs on sow and litter performance.

## Materials and Methods

- 336 newborn pigs (DNA 241 × 600, initially 3.83 ± 0.114 lb. BW) were used in a 21-d farrowing study.
- 28 litters were utilized with number of pigs per sow equalized on each day of farrowing. On the day of processing (approximately d 3 after birth), all piglets were weighed and six barrows and six gilts per litter were allotted to treatment in a completely randomized design for a total of 56 piglets per treatment.
- Gleptoforte to achieve either 50, 100, 150, 200, or 200 mg plus a 100 mg booster at d 11 of farrowing. Each 1 ml of Gleptoforte contained 200 mg of iron, thus injection dosage was 0, 0.25, 0.50, 0.75, 1.0, or 1.0 plus the 0.50 ml booster for each treatment, respectively.
- Piglets were weighed at processing, d 11, and weaning to calculate ADG during farrowing.
- One barrow per treatment per litter was utilized for blood collection via jugular venipuncture on d 3 (day of processing), d 11, and weaning (d 21). Blood criteria measured included: Hemoglobin (Hgb), Hematocrit (Hct), Serum Fe, and Total Iron Binding Capacity (TIBC). The lactation feed contained 110 mg/kg added iron from ferrous sulfate.

## Results and Discussion

- From d 3 to 11, ADG of piglets increased (quadratic;  $P = 0.002$ ) with increasing dosage of Gleptoforte. Day 11 ending BW of piglets increased (quadratic;  $P = 0.018$ ) with increasing dosage of Gleptoforte. From d 11 to 21, ADG of piglets increased (quadratic;  $P = 0.001$ ) with increasing dosage of Gleptoforte. Overall, ADG and d 21 ending BW improved (quadratic;  $P = 0.001$ ) with increasing dosage of Gleptoforte. However, there was no evidence of difference in performance in all three periods between the 200 mg and 200 mg+100 mg injection of Gleptoforte which suggests the booster injection of 100 mg iron at d 11 did not yield additional benefits compared to the pigs that received only the 200 mg at d 3.
- There was no evidence of difference observed for any hematological criteria measured on d 3 prior to the iron injection. For Hgb, a treatment × day interaction ( $P = 0.001$ ) was observed with Hgb increasing (quadratic;  $P = 0.001$ ) on d 11 and 21 with the 0 mg treatment having the lowest and the 200 mg treatment having the highest Hgb values, respectively. On d 21, a significant difference ( $P = 0.011$ ) was observed between the 200 mg and 200 mg + 100 mg treatments with the 200 mg + 100 mg treatment having a greater Hgb value.
- For Hct, a treatment × day interaction ( $P = 0.001$ ) was observed with Hct increasing (quadratic;  $P = 0.001$ ) on d 11 and 21 with the 0 mg treatment having the lowest and the 200 mg treatment having the highest Hct values, respectively. On d 21, a significant difference ( $P = 0.046$ ) was observed between the 200 mg and 200 mg + 100 mg treatments with the 200 mg + 100 mg treatment having a greater Hct value.
- For Serum Fe, a treatment × day interaction ( $P = 0.001$ ) was observed in which serum Fe increased (linear;  $P = 0.001$ ) on d 11 and increased (quadratic;  $P = 0.001$ ) on 21 with the 0 mg treatment having the lowest and the 200 mg treatment having the highest Serum Fe values, respectively. On d 21, a significant difference ( $P = 0.019$ ) was observed between the 200 mg and 200 mg + 100 mg treatments with the 200 mg + 100 mg treatment having a greater Serum Fe value.

## Results (continued)

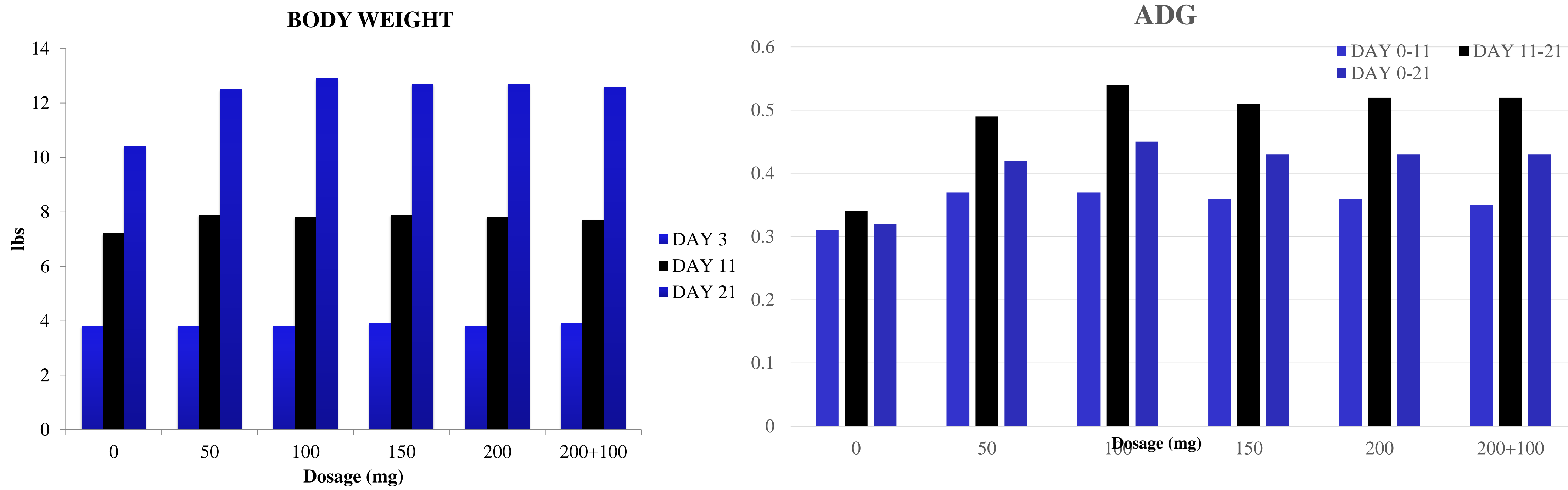


Table 2. Effects of Gleptoforte dosage on suckling pig hematological criteria

	Dosage, mg/ml2							Probability, P<		
								Quadrati 200 vs.		
	0	50	100	150	200	3	SEM	Linear 4 c5	200+1006	
Hgb (g/dl)7										
d38	8.4	8.3	8.3	8.3	8.2	8.4	0.25	0.719	0.85	0.613
d119	5.7	8.3	9.9	10.1	10.7	10.5	0.235	0.001	0.001	0.703
d21	4.6	6.8	9.3	11.3	12	12.8	0.217	0.001	0.001	0.011
Hct (%)										
d3	28	27.1	27.6	27.4	27.4	28	0.806	0.809	0.749	0.699
d11	20	29.2	34.3	35.8	36.5	36.2	0.66	0.001	0.001	0.722
d21	16	23.4	30.9	37.3	38.8	40.9	0.715	0.001	0.001	0.046
Serum Fe (ug/dl)7										
d3	26	24	30	29	25	24	3.82	0.816	0.463	0.838
d11	19	29	101	149	162	157	8.73	0.001	0.155	0.675
d21	22	15	25	53	86	113	7.85	0.001	0.001	0.019
TIBC (ug/dl)7										
d3	252	248	216	236	242	223	13.78	0.454	0.166	0.351
d11	698	536	442	417	406	421	22.77	0.001	0.001	0.669
d21	726	667	519	479	415	398	27.43	0.001	0.3446	0.67

- For TIBC, a treatment × day interaction ( $P = 0.001$ ) was observed. TIBC increased (quadratic;  $P = 0.001$ ) on d 11 and increased (linear;  $P = 0.001$ ) on 21 with the 0 mg treatment having the lowest and the 200 mg treatment having the highest Serum Fe values, respectively. There was no evidence for difference of TIBC between the 200 mg and 200 mg + 100 mg treatments on any of the days tested.

## Conclusions

- In summary, a lack of iron injection resulted in the poorest growth and blood parameters of iron status of suckling piglets as expected. However, the administration of 100 mg of Gleptoforte resulted in the greatest growth performance. Finally, the administration of 200 mg + 100 mg of Gleptoforte resulted in improved hematological criteria but did not influence suckling piglet growth performance compared to 200 mg alone.