



# FOCUS ON RESEARCH

## EFFECTS OF ORIGINAL XPC™ ON *SALMONELLA* PREVALENCE IN BROILERS DURING A *SALMONELLA* HEIDELBERG CHALLENGE

Researchers<sup>1</sup> challenged broilers with *Salmonella* Heidelberg after hatch and tested the effects of a control diet vs. a diet containing Original XPC at the standard or higher (2x) inclusion rate on *Salmonella* prevalence.

### RESEARCH SUMMARY

- 1,200 day-old male Cobb broilers were raised in floor pens.
  - Birds were vaccinated with Coccivac-B and not fed antibiotics in the diet.
  - Birds received one of three dietary treatments (8 replicate pens per treatment; 50 chicks per pen).
  - Treatments consisted of:
    - T1: Control (No XPC)
    - T2: XPC at 2.5 lb/ton in the starter diet (d 0 to 21) and 1.25 lb/ton in the grower (d 22 to 35) and finisher (d 36 to 42) diets.
    - T3: XPC at 2.5 lb/ton in the starter, grower, and finisher diets (d 0 to 42).
  - Diets contained 1395, 1423, and 1440 kcal/lb metabolizable energy and 20.96, 20.03, and 19.16 % crude protein in the starter, grower, and finisher diets, respectively.
- On arrival (d 0), 25 birds/pen (all treatments) were tagged and orally gavaged with 10<sup>8</sup> to 10<sup>9</sup> CFU of a nalidixic acid resistant strain of *Salmonella* Heidelberg. The remaining (non-challenged) birds were monitored for horizontal transmission of *Salmonella* Heidelberg.
- Performance (gain and feed conversion) was measured through d 35 and d 42.
- Litter drag swabs were collected from each pen on d 42.
- Birds (10/pen; 5 challenged and 5 non-challenged) were harvested on d 42.
  - Cecal contents were collected and analyzed for *Salmonella*.

### RESULTS

- Feed conversion was improved ( $P < 0.05$ ) through d 35 when birds were supplemented with 2.5 lb XPC/ton (T3) and through d 42 when birds were supplemented with either inclusion rate of XPC (T2 and T3; Table 1).

TABLE 1. FEED CONVERSION THROUGH D 35 AND D 42.

Treatment	Feed Conversion	
	d 35	d 42
Control (T1)	1.68 <sup>a</sup>	1.79 <sup>a</sup>
XPC at 1.25 lb/ton <sup>1,2</sup> (T2)	1.66 <sup>ab</sup>	1.77 <sup>b</sup>
XPC at 2.50 lb/ton <sup>1,2</sup> (T3)	1.64 <sup>b</sup>	1.75 <sup>b</sup>

<sup>1</sup> Original XPC, Diamond V, Cedar Rapids, Iowa

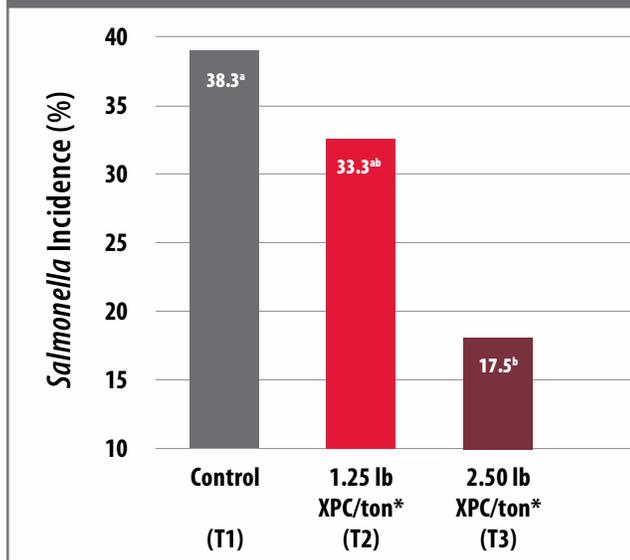
<sup>2</sup> Feeding rate of XPC during the growing (d 22 to 35) and finishing (d 36 to 42) phases of the study. Birds were fed 2.5 lb XPC/ton during starter phase.

<sup>ab</sup> Values, within column, with different superscript are statistically different ( $P < 0.05$ )

RESULTS (continued)

- Both challenged and non-challenged birds had cecal contents that were positive for *Salmonella* (28.3% and 30.4%, respectively). This indicates horizontal transmission of *Salmonella* to non-challenged birds.
- A reduction ( $P < 0.05$ ) in prevalence of *Salmonella* in the ceca was observed when birds were supplemented with 2.5 lb XPC/ton (T3; Figures 1 and 2). The number of ceca positive for *Salmonella* was reduced by half in birds supplemented with 2.5 lb XPC/ton (T3) compared to control birds (T1). Birds supplemented with the 1.25 lb XPC/ton (T2) were intermediate.
- In agreement with the cecal results, litter swabs were negative for *Salmonella* in 1 out of the 8 replicate pens for birds supplemented with 2.5 lb XPC/ton (T3). All pens were positive for *Salmonella* in the other two treatments (T1 and T2).

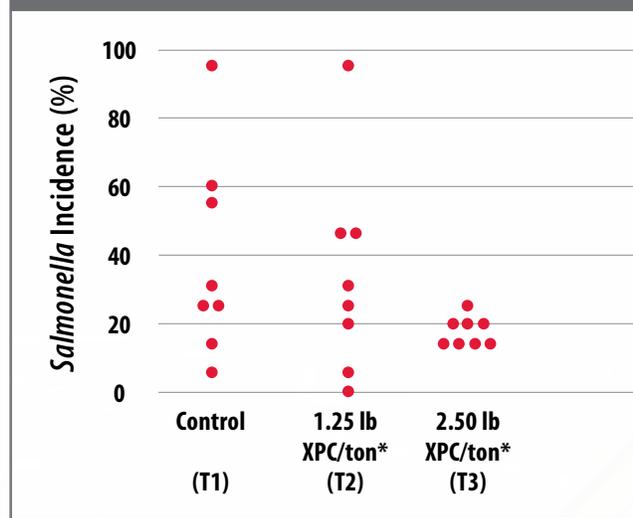
FIGURE 1. PREVALENCE OF *SALMONELLA* IN CECAL CONTENT



<sup>ab</sup> Values with different superscript are statistically different ( $P < 0.05$ ).

\*Feeding rate of XPC (Original XPC, Diamond V Cedar Rapid, Iowa) during the growing (d 22 to 35) and finishing (d 36 to 42) phases of the study. Birds were fed 2.5 lb XPC/ton during starter phase.

FIGURE 2. PREVALENCE OF *SALMONELLA* IN CECAL CONTENT (REPLICATE PEN AVERAGES [REP])



\*Feeding rate of XPC (Original XPC, Diamond V Cedar Rapid, Iowa) during the growing (d 22 to 35) and finishing (d 36 to 42) phases of the study. Birds were fed 2.5 lb XPC/ton during starter phase.

CONCLUSIONS

- Birds supplemented with Original XPC had significantly improved feed conversion compared to control birds.
- Supplementing birds with 2.5 lb XPC/ton throughout the 42 d study resulted in lower prevalence of *Salmonella* compared to control birds.

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If you would like more information on this study, please contact your local Diamond V representative.

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