

Effect of Corn Distiller's Dried Grains with Solubles (DDGS) and/or Antimicrobial Regimen on the Ability of Growing Pigs to Resist a *Lawsonia intracellularis* Challenge

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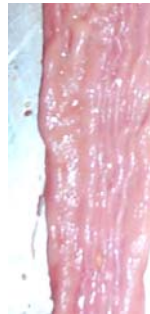
Distiller's Dried Grains with Solubles (DDGS)



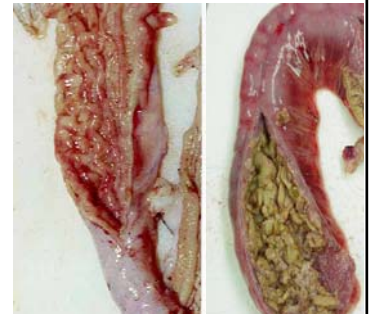
DDGS and Gut Health

- Field reports:
 - Beneficial effect of adding 5 to 10% DDGS in grow-finish diets
- DDGS contains low levels of soluble (0.7 %) and high levels of insoluble (42.2 %) fiber (Shurson et al., 2000)
 - Low soluble fiber diets may reduce the proliferation of pathogenic organisms in the GI tract (Hampson, 1999).
- DDGS contains yeast cells
 - May have nutraceutical properties

Healthy



Ileitis



Objective - Experiment 1

- Determine if dietary DDGS inclusion at 10 or 20% of the diet reduces the incidence or severity of ileitis in pigs infected with *Lawsonia intracellularis*



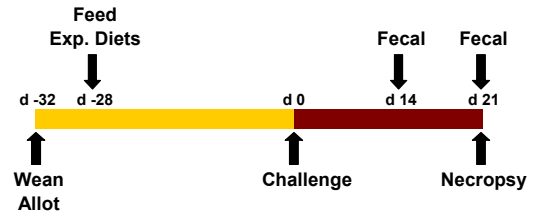


Methodology – Experiment 1

- Pigs:
 - Weaned at 17 d of age
 - Blocked by gender and weight
 - Fed experimental diets for 7 weeks
- Dietary treatments:
 - NC: Negative control, corn-soybean meal diet
 - PC: Positive control, corn-soybean meal diet*
 - D10: 10% DDGS diet*
 - D20: 20% DDGS diet*
 - Diets formulated to contain: 3390 kcal/kg ME, 1.15% AID lysine, 0.65% AID methionine & cystine, 0.80% Ca, and 0.70% P



Methodology – Experiment 1

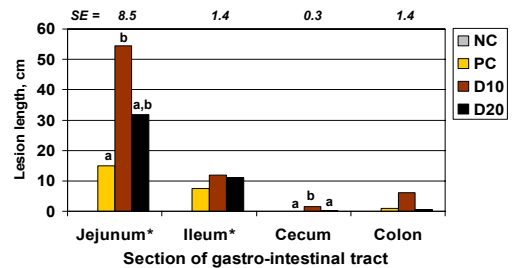


Methodology – Experiment 1

- Statistical analysis:
 - Utilized the GLM procedure of SAS (ANOVA and LSMeans)
 - Compared NC and PC treatments (effect of challenge)
 - Analyzed within challenged groups (effect of diet)
 - Individual pig = experimental unit



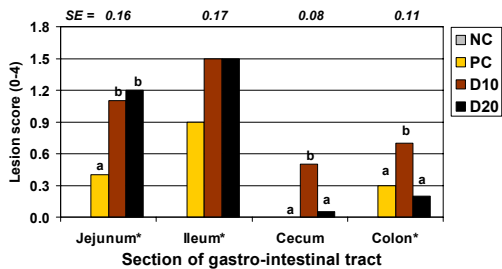
Effect of Dietary DDGS Level on Lesion Length, d 21 Post-Challenge, Exp. 1



^{a,b} Means not sharing a common superscript letter are different ($P < .05$).
* Effect of disease challenge ($P < .05$).



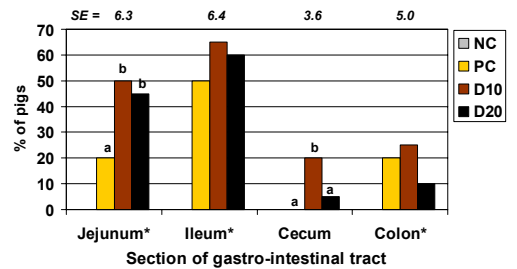
Effect of Dietary DDGS Level on Lesion Severity, d 21 Post-Challenge, Exp. 1



^{a,b} Means not sharing a common superscript letter are different ($P < .05$).
* Effect of disease challenge ($P < .01$).



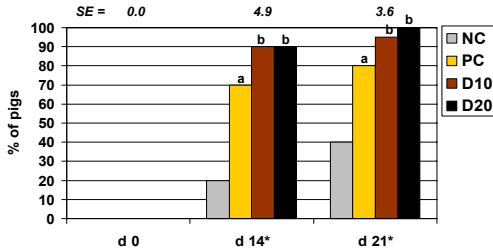
Effect of Dietary DDGS Level on Lesion Prevalence, d 21 Post-Challenge, Exp. 1



^{a,b} Means not sharing a common superscript letter are different ($P < .05$).
* Effect of disease challenge ($P < .01$).



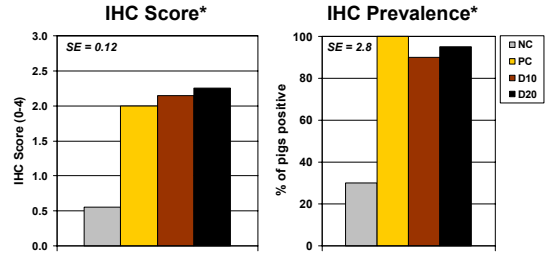
Effect of Dietary DDGS Level on Fecal Shedding (PCR Analysis), Exp. 1



^{a,b} Means not sharing a common superscript letter are different ($P < .05$).
* Effect of disease challenge ($P < .01$).



Effect of DDGS Level on *L. intracellularis* Infection (IHC Analysis), Exp. 1



^{a,b} Means not sharing a common superscript letter are different ($P < .05$).
* Effect of disease challenge ($P < .01$).



Summary of Results – Exp. 1

- DDGS inclusion did not improve the pig's ability to resist an ileitis challenge
- Dosage (inoculation) rate was higher than desired
 - Actual: 1.56×10^9 dose of *L. intracellularis*
 - Goal: 1×10^8 dose of *L. intracellularis*



Objectives - Experiment 2

- Determine if dietary DDGS inclusion can reduce the incidence or severity of ileitis in pigs infected with *Lawsonia intracellularis*
- Compare feeding a 10% DDGS diet to a currently approved antimicrobial regimen for ileitis

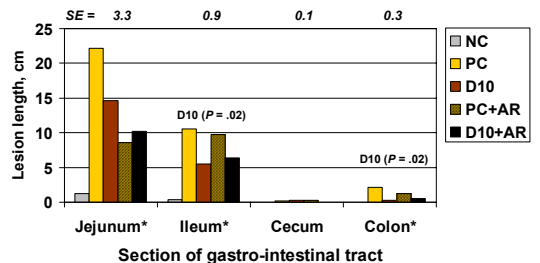


Methodology - Experiment 2

- Dietary treatments:
 - NC: Negative control corn-soybean meal diet, no antimicrobial
 - PC: Positive control corn-soybean meal diet, no antimicrobial*
 - D10: 10% DDGS diet, no antimicrobial*
 - PC+AR: Control diet with antimicrobial regimen*
 - D10+AR: DDGS diet with antimicrobial regimen*
- Antimicrobial regimen (AR):
 - Bacitracin Methylene Disalicylate (BMD[®])
 - Chlortetracycline (Aureomycin[®])
- Statistical analysis:
 - Compared NC and PC treatments (effect of challenge)
 - Factorial (2x2) arrangement of challenged treatments



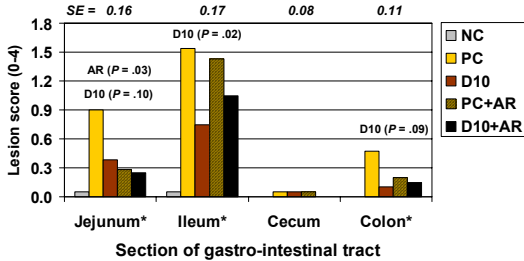
Effect of Dietary Treatment on Lesion Length, d 21 Post-Challenge, Exp. 2



* Effect of disease challenge ($P < .01$).



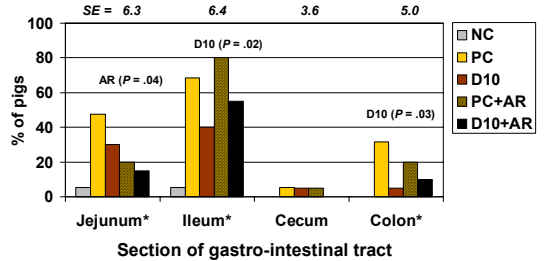
Effect of Dietary Treatment on Lesion Severity, d 21 Post-Challenge, Exp. 2



* Effect of disease challenge ($P < .01$).



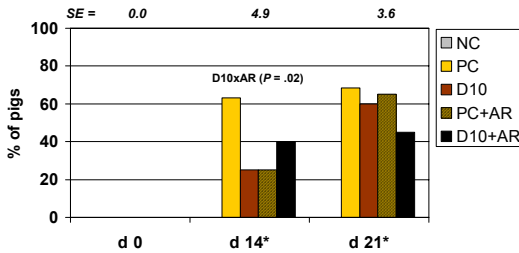
Effect of Dietary Treatment on Lesion Prevalence, d 21 Post-Challenge, Exp. 2



* Effect of disease challenge ($P < .01$).



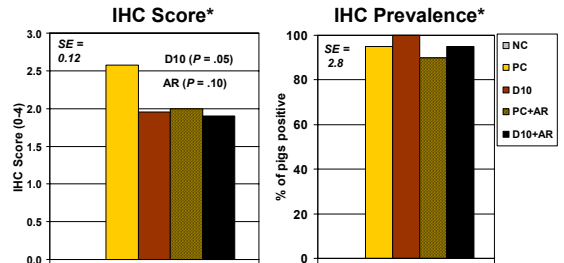
Effect of Dietary Treatment on Fecal Shedding (PCR Analysis), Exp. 2



* Effect of disease challenge ($P < .01$).



Effect of Treatment on *L. intracellularis* Infection (IHC Analysis), Exp. 2



* Effect of disease challenge ($P < .01$).



Summary of Results, Exp. 2

- Inoculation level was closer to goal
- DDGS inclusion (10%) or antimicrobial regimen had a positive effect on the pig's ability to resist an ileitis challenge
- No beneficial additive effects of combining DDGS and BMD®/Aureomycin® regimen



Implications

- Dietary inclusion of DDGS
 - May provide some benefit during moderate ileitis challenge
 - May not provide a detectable benefit during a severe ileitis challenge



Acknowledgement

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