



Response of weaned pigs to spray-dried porcine plasma and feed-grade antibiotics compared with antibiotic-free diets supplemented with Polyclonal IGY Antibodies (Wean Right™) and plant extracts (Nature's Fuel®).

FURST-MCNESS COMPANY

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Background

The use of antibiotic-free diets that are entirely animal protein free are becoming more common in use. Little data exists comparing traditional (animal protein) type diets with antibiotic-free vegetarian diets in terms of performance and profitability.

Methods

- 2,651, 21-d old weaned pigs in commercial wean-finish barns (33 pigs/pen, 8 pens/treatment) with FANCOM feed system.
- Feed treatments were added to NC diet consisting of polyclonal IGY antibodies derived from hyper-immunized whole eggs (WR=Wean Right) and plant extracts (NF=Nature's Fuel) to 21d post-weaning.
- 10 experimental diets in an incomplete factorial design were arranged in a 2 × 3 factorial (three levels of WR and three levels of NF added to the NC diet) and two treatments were tested for additivity of WR and NF.

Objectives

To compare growth promoting properties of dietary spray-dried porcine plasma (SDPP) and feed-grade antibiotics (Chlortetracycline and Denagard) as a positive control (PC), with a vegetarian diet without any antibiotics or SDPP as a negative control (NC), with NC that had different levels of phytonutrients, polyclonal egg antibodies, and phytonutrients and polyclonal egg antibodies in combination.

Experimental Diets

The diet was fed in a meal form. The Negative Control (NC) diet was made to represent an industry standard diet less the animal proteins. The Positive Control (PC) included 100 lbs. per ton of Plasma in Phase 1, and 50 lbs. per ton of Plasma in Phase 2. The key ingredient differences are shown below.

All diets were formulated to NRC (2012) requirements for pigs ranging from 10 to 50 lbs. live weight. All essential amino acids (Methionine + Cystine, Threonine, Tryptophan, Valine, Isoleucine) were balanced in both sets of diets by adding these as crystalline amino acids to replace the animal protein sources.

| Ingredient | NC | PC |
|---------------------------|----|----|
| Corn | √ | √ |
| Soybean Meal | √ | √ |
| Dried Whey | √ | √ |
| Lactose | | √ |
| Hamlet HP300 | √ | √ |
| Steam Rolled Oats | √ | √ |
| Animal Plasma | | √ |
| Fish Meal | | √ |
| Acidification | √ | √ |
| Zinc Oxide | √ | √ |
| Tri-basic Copper Chloride | √ | √ |
| Mannan Oligosaccharide | √ | √ |
| Pro-biotic Bacteria | √ | √ |
| Flavoring Agent | √ | √ |
| Enzyme Blend | √ | √ |



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Results

Table 1: Summary of Performance from Experiment 1 and 2

| Summary of Results Day 7 through 21 | | | | | | |
|-------------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|------|
| | PC | NC | NF | WR | WR+NF | SEM |
| ADG, g/d | 272 | 238 | 245 | 252 | 248 | 10 |
| ADFI, g/d | 324 | 335 | 322 | 318 | 302 | 10 |
| Gain: Feed | 0.81 ^a | 0.73 ^b | 0.76 ^b | 0.80 ^a | 0.81 ^a | 0.02 |
| Viability % | 91.8 | 88.7 | 89.5 | 91.2 | 93.5 | 1.7 |

Conclusion

- Diets with added Plasma and Feed-Grade Antibiotics grew faster and more efficiently than the Antibiotic-Free Vegetarian diet (P<0.05) and the treatment diets.
- Feeding polyclonal egg antibodies, and, polyclonal egg antibodies in combination with phytonutrients, both resulted in the same feed efficiency as that achieved by the PC.
- ADG of treatment diets tended to be higher than NC, but were not significantly greater.
- The joint use of polyclonal egg antibodies and phytonutrients resulted in a numerically-greater Viability (Livability) compared to all other treatments including the PC.



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ABSTRACT: The objective of this study was to compare growth promoting properties of dietary spray-dried porcine plasma (SDPP) and feed grade antibiotics (Ab=Chlortetracycline and Denaguard as a positive control PC) with a negative control diet (NC) without SDPP or Ab. The experiment involved 2,651, 21-d old weaned pigs housed in two commercial wean-finish barns (33 pigs/pen, 8 pens/treatment) with FANCOM feed weighing system. Feed treatments were added to NC diet consisting of polyclonal IGY antibodies derived from hyper-immunized whole eggs (WR=Wean Right) and plant extracts (NF=Natures Fuel) to 21d post-weaning. Ten experimental diets in an incomplete factorial design were arranged in a 2 × 3 factorial (3 levels of WR and 3 levels of NF added to the NC diet) and two treatments were tested for additivity of WR and NF. Due to veterinarian diagnosed E. Coli scour in both barns, Barn 2 was water medicated with Amoxicillin from d8-18. Data were analyzed using Proc. GLM from Minitab. Summary results from day7-21 are shown in Table 1. There was no effect of treatment from d0-7 on ADG and ADFI ($P > 0.05$). Water medication improved pig performance ($P < 0.05$). PC fed pigs had improved feed efficiency over NC fed pigs ($P < 0.05$). WR ($P < 0.05$) improved gain/feed ratio compared with NC diets. In summary, the dietary treatments of PC and the combination of Wean Right plus Natures Fuel resulted in similar feed efficiency ($G/F=0.81$) and was improved ($P < 0.05$) over the NC diet regime ($G/F = 0.73$) in commercial nursery pigs.

Table 1. Feed efficiency traits (least square means and SEM) from weaned pigs fed 3 levels of Wean Right and 3 levels of Nature Fuel added to antibiotic free vegetarian diets

| D7-21 | PC | NC | NF | WR | NF+WR | SE |
|--------------|-------------------|-------------------|-------------------|-------------------|-------------------|------|
| ADG, g/d | 272 | 238 | 245 | 252 | 248 | 10 |
| ADFI, g/d | 324 | 335 | 322 | 318 | 302 | 10 |
| Gain/feed | 0.81 ^a | 0.73 ^b | 0.76 ^b | 0.80 ^a | 0.81 ^a | 0.02 |
| Viability, % | 91.8 | 88.7 | 89.5 | 91.2 | 93.5 | 1.7 |

Key Words: Egg polyclonal IGY antibodies, Pigs, Plasma, Plant extracts, Feed grade antibiotics