

# COMPARISON OF DIAMOND V XP™ AND BIOSAF® IN PIGLETS WEANED AT 21 DAYS OF AGE

## Summary

The objective of this study was to compare the performance of piglets fed pre-starter feeds (phase 1 and 2) with either Diamond V XP™ Yeast Culture or Biosaf® live yeast in the first four weeks post-weaning. Forty-eight crossbred piglets of both sexes (barrows or boars), (21 days of age and 5.188 kg average body weight at weaning), were allocated to three treatments on the basis of maternity. Each treatment had 16 piglets, with 1 piglet per replicate and 16 replicates per treatment. Both Diamond V XP Yeast Culture and Biosaf produced significantly higher ( $P < 0.05$ ) average daily gain compared to the control group when evaluated for the entire trial period. Further, the average daily gain for piglets consuming Diamond V XP Yeast Culture was also significantly higher ( $P < 0.05$ ) than those fed Biosaf. Daily gain for the Diamond V XP group was 8.8% better than the Biosaf group and 15% better than the control. Overall, there were significant improvements ( $P < 0.05$ ) in feed efficiency between the control group and both yeast product groups. Relative to the control group, Diamond V XP Yeast Culture improved feed efficiency by 10.7% while Biosaf improved it by 5.1%.

## Materials and Methods

Forty-eight crossbred piglets of mixed sex were weaned at 21 days of age (5.188 kg average body weight) and allocated to one of three treatments on the basis of maternity. Each treatment had 16 piglets and the piglets were housed in individual units. Temperature in the pen was maintained within thermal neutrality and the humidity kept at 50-60%. All piglets had free access to the experimental feeds and water during the 28-day trial period from 21 to 49 days of age. The feed was dispensed manually in troughs on a daily basis.

Two commercial pig starters (NUTEC feeds) were used as the basal feed to which the test additives were introduced. Those starter feeds are described below:

Phase 1: NUPIG Omega Uno pellets were used as the basal diet for phase 1. Pellets contained cereal grains,

oilseed meal, hydrolyzed and standard fish meal, spray-dried animal plasma, spray-dried animal blood cells, vegetable protein concentrate, milk by-products, animal/vegetable fat, minerals, amino acids, and vitamins A, D<sub>3</sub>, E, K and B complex, and was medicated with 1200 ppm Oxytetracycline, 600 ppm Dimetridazole, and 55 ppm Carbadox. The chemical composition of the feed is shown in Table 1.

Phase 2: NUPIG Alfa Dos pellets were used as the basal diet for phase 2. Pellets contained cereal grains, oilseed meal, hydrolyzed and standard fish meal, spray-dried animal plasma, spray-dried animal blood cells, bovine meat meal, vegetable protein concentrate, milk by-products, animal/vegetable fat, minerals, amino acids, and vitamins A, D<sub>3</sub>, E, K and B complex, and was medicated with 110 ppm Tylosin, 110 ppm Sulfamethazine, and 55 ppm Carbadox. The chemical composition of the phase 2 feed is also shown in Table 1.

Measurements were obtained for feed intake, bodyweights at 21, 35, and 49 days of age, incidence and prevalence of diarrhea and mortality rates. Daily weight gain and feed conversion were calculated accordingly.

**Table 1. Chemical composition of the basal feed**

Parameter	Phase 1	Phase 2
Crude Protein, %	21	19
Crude Fat, % min.	4	3
Crude Fiber, % max.	4	6
Moisture, % max.	12	12
Ash, % max.	7	7
<b>Medications, ppm</b>		
Oxytetracycline	1200	
Dimetridazole	600	
Carbadox	55	55
Tylosine		110
Sulfamethazine		110

The experimental layout and yeast product inclusion rates are shown in Table 2. Statistical evaluations were carried out by ANOVA and the means were compared using Duncan's multiple range test. Significant differences were declared at  $P < 0.05$ .

**Table 2. Experimental layout and inclusion rates for test products in complete feeds**

Phase 1: 21 - 35 days of age	
Control	Control diet without yeast product
Biosaf	Control diet + Biosaf at 2 kg/MT
XP	Control diet + Diamond V XP at 5 kg/MT
Phase 2: 35 - 49 days of age	
Control	Control diet without yeast product
Biosaf	Control diet + Biosaf at 2 kg/MT
XP	Control diet + Diamond V XP at 3 kg/MT

## Results and Discussion

**Phase 1 (21 - 35 days of age):** There were no statistically significant differences in feed intake between treatments (Table 3). Significant differences ( $P < 0.05$ ) in weight gain were noted between the control group and the two yeast products. Numerical differences were observed in daily gain between Diamond V XP and Biosaf, with gains of piglets fed Diamond V XP being 24% higher than the negative control and 8% higher than the Biosaf group. Piglets in the groups fed diets with yeast products had significantly improved ( $P < 0.05$ ) feed efficiencies relative to the negative control group.

**Table 3. The effect of yeast products on feed intake and liveweight gain from 21 to 35 days of age**

Item	Control	Biosaf	XP
Feed Intake, g/day	202	204	204
Average Daily Gain, g/day	145 <sup>a</sup>	167 <sup>b</sup>	180 <sup>b</sup>
Feed to Gain, kg/kg	1.39 <sup>a</sup>	1.22 <sup>b</sup>	1.13 <sup>b</sup>
Weight at 21 days, kg	5.24	5.19	5.13
Weight at 35 days, kg	7.28	7.54	7.66
Feed Intake, g/day Days 21 - 28	161	161	165
Feed Intake, g/day Days 28 - 35	244	246	243
Intake/kg BW, g/day	32.3	32.1	32.0

<sup>a, b</sup> Means in the same row with no common superscript differ significantly ( $P < 0.05$ ).

**Phase 2 (35 - 49 days of age):** Feed intake was not significantly different between treatment groups in this phase. At 49 days, piglets on Diamond V XP Yeast Culture weighed 1 kg heavier ( $P < 0.05$ ) than the control (Table 4). These piglets were also 5% heavier than those on Biosaf, though this difference was not statistically significant.

Although significant differences between treatments were not observed in daily gain, it was noteworthy that the daily gain was numerically improved compared to the control group when yeast products were added to the feed. Moreover, the improved gain in the groups receiving yeast products was also reflected in the numerically improved feed efficiencies in these groups.

**Table 4. The effect of yeast products on feed intake and liveweight gain from 35 to 49 days of age**

Item	Control	Biosaf	XP
Feed Intake, g/day	522	524	543
Average Daily Gain, g/day	430	442	481
Feed to Gain, kg/kg	1.21	1.19	1.13
Weight at 35 days, kg	7.28	7.54	7.66
Weight at 49 days, kg	13.3 <sup>a</sup>	13.7 <sup>ab</sup>	14.4 <sup>b</sup>
Feed Intake, g/day Days 32 - 42	455	476	479
Feed Intake, g/day Days 42 - 49	590	579	607
Intake/kg BW, g/day Days 32 - 49	51	49.3	49.4

<sup>a, b</sup> Means in the same row with no common superscript differ significantly ( $P < 0.05$ ).

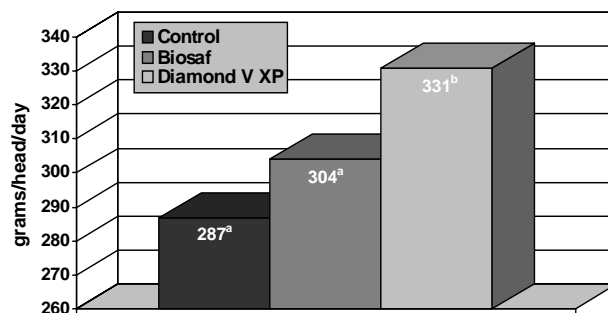
**Total Period (21 - 49 days of age):** No clinical disease symptoms or mortality incidences were observed during the trial. In addition, no differences in feed intake were observed during the trial (Table 5). Diamond V XP Yeast Culture resulted in significantly higher ( $P < 0.05$ ) average daily gains compared to both control and Biosaf when evaluated for the entire trial period (Figure 1). Average daily gain in the Diamond V XP group was 9% better than the Biosaf group and 15% better than the control group.

Overall, there were significant improvements ( $P < 0.05$ ) in feed efficiency between the control group and both yeast product groups. Relative to the control group, Diamond V XP improved feed efficiency by 10%, while Biosaf resulted in a 5% improvement.

**Table 5. The effect of yeast products on feed intake and liveweight gain (21 to 49 days of age)**

Item	Control	Biosaf	XP
Feed Intake, g/day	362	364	373
Average Daily Gain, g/day	287 <sup>a</sup>	304 <sup>a</sup>	331 <sup>b</sup>
Feed to Gain, kg/kg	1.26 <sup>a</sup>	1.20 <sup>b</sup>	1.13 <sup>b</sup>
Weight at 21 days, kg	5.24	5.19	5.13
Weight at 49 days, kg	13.3 <sup>a</sup>	13.7 <sup>ab</sup>	14.4 <sup>b</sup>

<sup>a, b</sup> Means in the same row with no common superscript differ significantly ( $P < 0.05$ ).



<sup>a, b</sup>  $P < 0.05$

**Figure 1. The effect of yeast products on average daily liveweight gain from 21-49 days of age**

## **Conclusion**

Results of these data suggest that although feeding live yeast products may elicit a small performance response when fed to nursery pigs at the recommended level, feeding a fully fermented yeast product, such as Diamond V XP Yeast Culture, will result in a growth response superior to that of live yeast products.

## **Research Source**

Miguel Forat. 2002. Instituto Internacional de Investigación Animal (IIIA) experimental station. Querétaro, Mexico.