

## The Effect of a Nutritional Supplement on Stillbirths in Swine

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### ABSTRACT

Stillborn pigs resulting from exhaustion of the sow during farrowing reduce the reproductive efficiency in swine herds. The purpose of this study was to test the effects of a nutritional supplement (ParturAid) on the number of stillbirths per litter at a Danbred North America site. ParturAid is a product designed to increase the sows energy and in turn reduce the number of stillborn pigs per litter. A 30 ml dose of ParturAid was administered orally at zero to eight hours prior to farrowing. Standard farrowing assistance was given as needed. In this study the ParturAid did not reduce the number of stillborn pigs.

Keywords: *stillbirths, swine, ParturAid*

### INTRODUCTION

The farrowing process is stressful to both the sow and the newborn pig. Sows experience cervical dilation, uterine contractions and muscular contractions of the flank, belly, and tail (Motsi 2006). Many things must happen in order to produce a living, viable offspring. In some cases the process of giving birth is not successful and the young animal is stillborn.

Stillbirths have an impact on the profitability of a farm (Christianson 1992). Stillbirths can be linked to prolonged farrowing, umbilical cord damage, birth during the last one-third of parturition, infection during pregnancy, placental insufficiency, and temperature stress (Christianson 1992, Leenhouders 2003, Stanton 1974).

In an average pig litter, stillbirths and mummies account for the loss of one pig per litter. The size of the operation has little influence on the number of stillbirths (USDA 2006).

Maternal and direct genetics both influence stillbirths. Thus increased selection for farrowing survival is associated with a reduction of stillbirths (Leenhouders 2003).

Oregano is a nutritional supplement that has been studied to enhance sow productivity. The hypothesis was that the antibacterial, anti-inflammatory, antioxidant, and appetite-enhancing ability of essential oils in oregano would enhance voluntary daily feed intake and farrowing rate, which would improve live born and decrease stillbirths. The oregano did improve sow health and productivity, but did not set it apart from any other feed additive (Allan 2003).

ParturAid is a product that is promoted to help increase the sow's energy level and to reduce dystocia (ParturAid protocol). Providing ParturAid to sows at the start of farrowing has been shown to reduce the time interval between the birth of piglets (van Kempen). ParturAid has been shown to reduce stillbirths by 0.44 pigs and neonatal mortality by 0.26 pigs per litter giving a total increase in litter size of

0.70 pigs. Provimi, a nutritional company based in Europe, developed the product. The product is a mixture of minerals, vitamins, and other natural antioxidants. This combination of nutrients is designed to help support metabolism and muscle function during farrowing to give the animal the right amount of energy and nutrients so that the last pigs in the birth order do not die in the birth canal.

Danbred is the leading swine genetics program in Denmark. Danbred North America is an extension of the Danish company. Their purpose is to market the Danish genetic program in the United States and Canada. The company has four nucleus sites. Three out of the four sites are located in Nebraska and the fourth site is located in South Dakota. The focus of the company is to produce a quality animal at a low cost. The Danbred system focuses on three breeds, Yorkshire, Landrace, and Duroc.

The purpose of this study was to test the effects of Parturaid on the number of stillbirths per litter at a Danbred North America nucleus site.

### MATERIALS AND METHODS

The study was done at the Adams Nucleus farm located at Roseland, Nebraska. This unit contains only purebred Landrace and Yorkshire females. The farm has eight farrowing rooms and there are ten crates located in each room. The rooms are equipped with drip cooling systems where water drips onto the animals in the crates to keep them cool during the hotter days of the summer. Each room has two fans to circulate air throughout the room.

The study began on June 11, 2007 and lasted until August 2, 2007. Eighty nine animals were included; 26% Yorkshire and 74% Landrace.

When the sows and gilts reached zero to 4 days prior to their due date they were brought from the gestation barns and placed in the farrowing crates. The animals were assigned to crates at random. Prior to farrowing each animal was fed six pounds of

**Table 1. Comparison of means from the ParturAid and control groups**

Group	Litters	Total Born	Live Born	Stillborn	Mummies
ParturAid	38	14.8	12.0 (81%)	2.4 (16%)	0.4 (3%)
Control	51	13.8	11.6 (84%)	1.8 (13%)	0.3 (2%)

a farrowing ration once a day. The ration was composed of corn, soybean meal, soybean hulls, fat, monocalcium phosphate, calcium carbonate, salt, sow micro 5 w/se-yeast phy 600, replacement gilt micro booster, biolysine, 1-threonine, and Chromax. The ration contained 20.21% protein, 1.20% lysine, 6.38% fat, 3.03% fiber, 0.95% calcium, 0.72% phosphorus, 0.50 % salt, and 0.22% sodium. The animals in even numbered crates were treated with ParturAid and the animals in the odd numbered crates served as controls. ParturAid was given 0 to 8 hours prior to parturition. ParturAid was administered orally in 30 ml doses. At the recommendation of Danbred an animal that did not farrow within the 8 hour window received a second treatment at the same dosage.

ParturAid consists of glycerine, dicalcium phosphate, invert sugar syrup, sorbitol, taurine, magnesium sulphate, natural antioxidant, zinc sulphate, flavour, sodium chloride, potassium chloride, citric acid, silicon dioxide, benzyl alcohol, potassium sorbate, alpha tocopherol acetate, ascorbic acid, menadione sodium bisulphate, and sodium selenite. Parturaid contains 25% ash, 3.5% calcium, 3.5% phosphorus, 3.5% protein, 14% moisture, and other trace percentages of oil, fiber, sodium, and potassium.

Females received treatment based on the observation of the physical signs that farrowing is about to begin. The animals were checked for milk. Dropping of milk into the utter often was a sign that the farrowing process was going to begin within the next 24 hours. The animals were also checked for dilation of the cervix and swelling of the vulva. Animals were watched for signs of increased breathing rate and restlessness, as these could be additional signs of the start of the farrowing process.

Once the farrowing process began the normal Danbred protocol was used for assisting sows. The sow would be checked on every 30 minutes. If there was progress made the animal would be left for another 30 minutes. If no progress had been made in the animal would be assisted. When assisting the animal live pigs were pulled and the animal would then be left for an additional 30 minutes. In the situation where stillborns or underdeveloped fetuses were pulled the animal would be given 0.5 ml of oxytocin and then checked on in another 30 minutes. Once the animal had finished the farrowing process the animal was assisted once more to check for piglets that may still be inside the uterus. If none were found the animals would be given a 0.5 ml

injection of oxytocin.

Farrowing date, parity, live born, stillborn, mummies, and total born were then recorded. At the end of the eight week study the averages of the live born, stillborn and mummies were compared. The data failed the normality test, thus it was analyzed using the Rank Sum Test.

## RESULTS

The average values for the treatment group were 14.8 total born, 12.0 live born, 2.4 stillborn, and 0.4 mummies per litter. The averages for the control group were 13.8 total born, 11.6 live born, 1.8 stillborn, and 0.3 mummies per litter (Table 1). The number of stillbirths was not significantly different ( $P = 0.337$ )

The average number of stillbirths for the Landrace and Yorkshire breeds was 2.38 and 1.26, respectively. This difference was statistically significant ( $P = 0.009$ ). The number of stillbirths within breeds did not differ between the treatment and control groups (Table 2).

**Table 2. Breed differences in number of stillbirths**

Breed	Treatments	Controls	P value
Landrace	2.88	2.07	0.250
Yorkshire	1.54	0.9	0.365

## DISCUSSION

The results of this study were not consistent with the manufacturer's claim that ParturAid would reduce stillbirths. Nor did they agree with an 800 sow study by van Kempen in which ParturAid showed a decrease of stillbirths by 0.44 pigs per litter. There is no apparent explanation for why the Parturaid did not reduce the number of stillborn animals.

Another study over a longer time period with more females might be advised. Extending the time period would provide more animals for the evaluation of the product. A year long study would evaluate the product under a variety of temperature stresses. Further research might also evaluate different dosages of ParturAid.

It is known that assistance at parturition reduces the number of stillbirths, thus a future study might be conducted without providing assistance to better

evaluate the effectiveness of Parturaid.

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