



BIOBASE™ SWINE

Product Information Sheet

BIOBASE™ SWINE is a liquid feed additive derived from microbial fermentation that provides a growth stimulus to microbial populations present in the digestive tract of swine. When feeding swine for production, the more feed the animal will eat and digest, the more meat it will produce. Or to put it another way, the faster the swine can eat and digest a given amount of feed the sooner it will be back to eat some more.

Digestibility refers to those nutrients which are broken down by microflora, or are solubilized by some digestive enzyme and are absorbed through the lining of the gut into the blood and body fluids of the animal. Therefore, the term digestibility, as used here, implies both digestion and absorption of the feed.

Digestibility of feeds is variable and affects how well a feed will be utilized by the animal. As most minerals are ingested by the animal, a certain portion will be absorbed in the digestive system and the remaining portion will remain unabsorbed. Of the absorbed portion, some will be incorporated into the tissue and bones of the animal, some will be released from various tissues and excreted into the intestine and eliminated along with the unabsorbed minerals in the feces and urine. Actually a fairly high percentage of the mineral content may have been solubilized and digested by the animal, and performed various functions within the body of the animal before being excreted. Therefore, the measuring of digestibility of the mineral content only as that amount of intake not recovered in the feces would not be accurate. Instead, mineral balances are carried out in which all of the intake and output are measured to determine what balance is retained in the body of the animal.

Efficient feed conversion as well as high levels of production are both characteristic of advanced feed rations. As science has increased the knowledge base concerning nutrient requirements of commercial stocks as well as the nutrient content of feed ingredients, feed rations have been developed that provide needed nutrients at the lowest cost.

Increasing demands upon swine production necessitate continued greater efficiency. Changes in breeding and management, and the introduction of new feedstuffs and methods of feed processing influence nutrient metabolism and requirements. Water, energy, protein, vitamins and minerals must be provided in the correct amounts and proportions if optimum results are to be obtained in the support of maintenance, normal growth and reproduction in swine.

Monogastric's, such as swine, cannot utilize amides, simple nitrogenous compounds found



particularly in young growing plants, but can utilize the simpler nitrogenous compounds consisting of amino acids and combinations of amino acids as if they were protein. To make a molecule of protein in the body of the swine, several different amino acids are necessary in different proportions for each kind of protein the body is building. The amino acids essential to swine are:

Arginine
Methionine
Histidine
Isoleucine
Leucine
Lysine
Phenylalanine
Threonine
Tryptophan
Valine

Most diets are composed of one or more grains, together with soybean meal or other protein sources that complement the indispensable amino acids lacking in the grains. These major ingredients of the diet should be supplemented with vitamins and essential mineral elements to provide all the known nutrient requirements.

The proprietary two stage fermentation process used in **BIOBASE™ SWINE** provides a microbial growth medium consisting of amino acids, peptides, enzymes, co-enzymes and growth factors necessary for optimum growth and activity of microorganisms. Thus **BIOBASE™ SWINE** stimulates beneficial gastrointestinal microorganisms thereby improving the digestion and conversion of feed to weight gain in swine. In addition, **BIOBASE™ SWINE** is blended with proteinated and chelated trace minerals essential for microbial growth and in a form readily absorbed through the intestinal wall of the animal. Enzymes derived from controlled fermentation processes make available exogenous sources that are cost effective and able to hydrolyze fibre or non-starch polysaccharide fractions, such as those found in cereal grains. The exposure of feed grain to changing pH and digestive enzymes during passage through the digestive tract may alter both the quantity and characteristics of the soluble fractions. Thus, simple measurements of the soluble content of grains will not provide accurate predictions of their nutritive value as a feed ration component. Enzymes capable of hydrolyzing grain cell walls are found in a wide range of microbial sources.

It is known that breed, strain and sex effect growth rate, feed conversion and carcass composition, and, therefore, these factors influence nutrient requirements. The required dietary level will also be influenced by:

1. Feed intake



2. Energy density of the diet
3. Level and interaction of nutrients in the diet
4. Availability of nutrients to the animal
5. Presence and level of feed additives
6. Environmental temperature, housing conditions, and level of subclinical disease
7. Presence of toxins, inhibitors or molds in the diet
8. Expected level of performance and carcass composition

Carbohydrates, lipids, proteins, minerals, vitamins and water are the 6 classes of nutrients required for maintenance, growth and reproduction of swine. Each nutrient has specific functions and, in addition, carbohydrates, lipids and proteins are used to supply the energy requirements of animals, but with different levels of efficiency.

Another important factor in nutrient availability is intestinal viscosity. Although the exact effects of viscosity have not been established, possible mechanisms include reduced rates of diffusion of endogenous enzymes and nutritional substrates. As the viscosity of a solution increases, the rate of nutrient diffusion decreases and there is a compounding reduction in nutrient assimilation. In fact, the larger the molecule in question, the greater the impact of increasing digestive viscosity on its rate of diffusion. Whether viscosity is the direct cause of reduced nutrient assimilation or merely a result or indicator of other anti-nutritional activities present has not been determined.

INGREDIENTS

From a nutritional standpoint there is no one best formula in terms of ingredients that are used. Ingredients should therefore be selected on the basis of availability, price and quality of the nutrients they contain. In formulating diets to meet the recommended nutrient requirements of swine, it is necessary to know the nutrient composition and the bioavailability of nutrients in each ingredient used. **BIOBASE™ SWINE** is a liquid feed additive derived from microbial fermentation that provides a growth stimulus to microbial populations present in the digestive tract of swine. It may be used in virtually any conventional management system. Fed continuously during the weaning, growing and finishing phases, improved feed efficiency and growth will be observed. **BIOBASE™ SWINE** can be added directly to growing and finishing diets through vitamin-mineral premixes or supplements. The stimulus of the beneficial gastrointestinal micro-organisms improves the digestion of feed within the swine digestive tract and increases efficiency of feed conversion to weight gain.

MINERALS

At least 13 inorganic elements are known to be required for swine production including:

Calcium

Sulfur



Phosphorous
Potassium
Sodium
Chlorine
Magnesium
Iodine

Zinc
Iron
Manganese
Copper
Nickel
Selenium

Functions of the inorganic elements are extremely diverse, ranging from structural functions in sub-tissues to a wide variety of regulatory functions and many others. The increasing trend toward confinement rearing of swine, without access to soil or forage, increases the importance of meeting the dietary mineral requirements.

VITAMINS

Vitamins are organic compounds required in small amounts for normal growth and reproduction and for maintaining the health of swine. Their benefit in survival and continued health was discovered long before their chemical nature was learned. A distinction must be made between dietary requirements and metabolic requirements. Some vitamins are essential in metabolism but may not be required in the diet, since they can be synthesized readily from other food constituents. For example, whereas vitamin B complex are synthesized by micro-flora in the rumen of cattle, swine must have a vitamin B complex in their diet.

WATER

Swine receive water from 3 sources, namely, metabolic water from the break down of carbohydrate, fat and proteins; water that is a component of feed stuffs; and water that is drunk. The later makes up a large portion of the normal intake, although all that is required may be supplied by liquid feed such as whey.

Water is involved in many physiological functions necessary for maximum animal performance including temperature regulation, transporting nutrients and wastes, metabolic processes, lubrication and milk production. Water will account for as much as 80% of body weight at birth but declines to approximately 50% in a finished market swine. Under normal conditions swine will consume 2.0-5.0 kg of water per kilogram of dry feed or 7-20 kg of water per 100 kilogram of body weight daily. A younger animal will have higher requirements than the older swine.

HOW DOES BIOBASE SWINE WORK

The presence of billions of micro-organisms in the digestive tract of the swine are necessary to promote the digestion of feed into end products that can be readily absorbed by the digestive system of the animal. These materials become a necessary part in the metabolic



processes of activity, growth, reproduction and disease resistance. **BIOBASE™ SWINE** provides necessary amino acids, peptide's, enzymes, co-enzymes and other essential growth factors which improve both the microbial environment and stimulate the growth and activity of beneficial micro-organisms in the digestive tract of the animal enabling it to more fully complete the digestion of feed into essential nutrients that can be easily assimilated through the wall of the intestinal tract.

The inclusion of **BIOBASE™ SWINE** in feed formulations will enhance the growth and activity of beneficial gastrointestinal micro-organisms and stimulate an increase in feed efficiency and weight gain in swine. The addition of **BIOBASE™ SWINE** will also improve feed digestion and efficiency of the breeding herd. The proteinated and chelated trace minerals present in **BIOBASE™ SWINE** have a high bio-availability and are formulated to enhance growth and reproductive functions in swine. Daily use, except during gestation, is recommended for maximum results.

BIOBASE™ SWINE improves the profitability of the animal operation by increasing the dollar return. This improvement in profitability is realized through (1) healthier and more efficient animals; (2) animals tend to finish in less time as a result of the faster growth; (3) less feed is required per animal from weaning to finish; (4) carcass gain has a higher lean content resulting from improved protein digestion and absorption; (5) there is a general improvement in animal health from improved nutrient utilization and reduction in stress caused from improper nutrient balances; (6) animals also tend to recover faster from disease conditions when nutrient balances are optimized, therefore morbidity and mortality are generally reduced.

GUARANTEED ANALYSIS

Stablized liquid <i>L. acidophilus</i> and <i>P. freudenreichii</i> fermentation product	52%
Manganese (Mn)	.15%
Copper (Cu)	.28%
Zinc (Zn)	.22%
Iron (Fe)	.55%

APPLICATION RATES

Mix **BIOBASE™ SWINE** at a rate of 265-530 ml/MT (8-16 oz./ton) of feed or apply in drinking water. Tank mix only after other liquid products have been fully diluted.

Variable Rate Application:

40-100 lbs. at 520 ml/MT (16 oz./ton) of feed.



100-150 lbs. at 400 ml/MT (12 oz./ton) of feed.

150-220 lbs. at 260 ml/MT (8 oz./ton) of feed.

Constant Rate Application: Mix 400 ml/MT (12 oz./ton) of feed during entire feeding period.

Hand Feeding: Feed at a rate of 3/4 to 1 ml./head/day or 30 ml (1 oz.) of liquid for each 30-40 head of swine.

LACTATING SOWS

Apply **BIOBASE™ SWINE** in feed or water at the rate of 1-2 ml/animal/day. Alternatively, apply to feed at the rate of 100-150 ml/MT (3-5 oz/ton). **DO NOT ADMINISTER DURING GESTATION.**



GROWING SWINE

Apply **BIOBASE™ SWINE** in feed or water at the rate of 400 ml/MT (12 oz/ton). Alternatively at the following rates:

BODY WEIGHT	ml/MT (oz/ton) feed
18-45 kg (40-100 lbs)	520 (16)
45-68 kg (100-150 lbs)	400 (12)
68-100 kg (150-220 lbs)	260 (8)

Handfeeding: Feed at a rate of .75-1.0 ml/animal/day.

Swine feed rations supplemented with **BIOBASE™ SWINE** have shown the following beneficial effects:

- Decreased mortality
- Lower incidence of diarrhea
- Earlier weaning
- Increased feed efficiency
- Increased production of volatile fatty acids essential to the animal's fermentation process
- Increased weight gain and growth

BIOBASE™ SWINE may be used in virtually any conventional livestock management system. Fed continuously during the weaning, growing and finishing phases it will improve feed efficiency and growth. **BIOBASE SWINE** can be added directly to growing and finishing diets through vitamin-mineral premixes or supplements.

Much of the information on nutrient requirements of Swine came from, *Nutrient Requirements of Domestic Animals*, Number 2, eighth revised edition, 1979, Subcommittee on Swine Nutrition, Committee on Animal Nutrition, National Research Council. National Academy Press, Washington, D.C. 1979.

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