

Results of Research and Clinical Trials done on Diatomaceous Earth based Feed additives

The potential benefit of the addition of Diatomaceous Earth to animal feeds has been evaluated for many years by many different researchers and many different types of livestock producers. Diatomaceous Earth is approved for use in animal feeds as an anti-caking agent and as an inert carrier up to 2% of total diet in both Canada and the U.S.A.

Diatomaceous Earth in Poultry Diets:

Diatomaceous Earth has been evaluated for its effectiveness in poultry diets. The use of clay based additives to control Coccidiosis was studied by St Aubin and Quarles, 1992. The diatomaceous earth was shown to destroy the protective coating of the Eimeria organisms themselves. D.E. was also shown to affect Coccidiosis by forming a protective coating on the mucous membrane of the digestive tract which would improve the bird's resistance to infection of the digestive tract by the intestinal parasites that cause Coccidiosis. (Vermeer and Ferrell 1985). Dietary clay based products may also prove to be an alternative to the use of anti-biotic (Campbell and Ephgrave, 1983). Reductions in fecal moisture content in poultry litter when feeding Diatomaceous earth is a very real benefit to producers. Drier Faces translates into drier litter, which reduces ammonia gas emissions from the litter. The harmful effects of ammonia to poultry are well documented. Ammonia gas levels have been directly linked to eye lesions, respiratory infections and lower growth rates and feed efficiency. (Anderson et al. 1964: Quarles and Kling 1974: Mashadidni and Beck 1985: Weaver and Meijerhof: 1991) Addition of Diatomaceous earth to poultry diets has also been shown to increase feed efficiency in some studies. (Ousterhout 1967: Harms and Damron. 1973: Sellers et al. 1980). This is due largely to the effectiveness of the product as an anti-caking agent. Addition of D.E. as an anti-caking agent prevents the clumping of feed particles keeping them separate allowing for larger amount of the surface area of the feed to be exposed to the digestive process. This appears to slow the passage of feed through the gut and allows for an increase in the uptake of nutrients from the diet. It may also alter the gut fauna, thereby improving the supply of feed and bacterial protein in the intestinal tract. Diatomaceous Earth as an anti-caking agent also improves the flowability, mixability and handling of the feed. Diatomaceous Earth has also been shown to absorb anti-nutritional compounds in poorer quality feeds such as [aflatoxins](#) in moldy grain. (Schell et al. 1993). Field trials done by *C.S. Mangen DVM of San Diego, California* with caged layers in their pullet year showed for main impacts: 1) Reductions in presence of flies in the test group, 2) Droppings were of a drier consistency, making for easier cleaning of the house, 3) 75% less deaths in the test group 4) a 2-4 case per day increase in egg production in the test group.

Diatomaceous Earth in Dairy, Beef and Swine diets

The main uses of diatomaceous earth based products when fed to dairy and beef cattle and horses are as a parasite control aid, a digestive aid and colon cleanser, and as source of valuable trace minerals. It is also a valuable inert carrier for nutrients and medicaments for release through the gut. The structural features of the diatoms (sharp abrasive particles) that make it effective as a natural insecticide are the main reason research and field studies have shown reductions in the presence of internal parasites. This abrasive action has not been shown to cause any insult to the mucous or barrier wall, in fact it may be creating a protective coating. A field study done by *G.L. Maddox of Glendale Arizona*, with 169 steers fed a standard fattening ration showed increases in Average gain/head of 196.50 in the control group to 258.80 lbs. in the test group. The lbs. of feed/lb. gain was only 8.23 lbs. compared to 9.78lb in the control group. The average cost/lb. gain was \$.2150 compared to \$.2428 in the control group. There are a wide range of trace minerals in most Diatomaceous Earth based additives. Commonly found trace minerals include: Copper, Zinc, Selenium, Manganese, Phosphorus, Cobalt, Rubidium, as well as major nutrients like Calcium, Iron, Magnesium, Aluminum and Sodium.

Diatomaceous earth could also be acting as a rumen buffer, or alkalizing agent in the feed. The typically low pH of 5-6, make it ideal assisting in regulating the balance in the gut and decreasing problems with acidosis. In some cases, Diatomaceous Earth has been linked to a reduction in scours in dairy calves. Dr. Don Johnson DVM from Saskatchewan recommends offering

Diatomaceous Earth free choice to all dairy cows especially calves on a regular basis. Many producers report that this practice has resulted in a dramatic reduction in scours in their herds.

Horses were also "cured" of their scours during the field trials done by **L. Frank Roper Stables in Winter Garden Florida**. These walking horses were fed approximately 5 ounces twice a day, they had a noticeable reduction in the incidence of Scours, and decreases in fly populations in the horses stalls were also noted. The horses had increased appetites with weight gains due to better feed conversion, Reductions in odour from manure and the elimination of any internal parasites was also documented. Trainer, L. Thomas also noticed an overall healthier appearance of his horses.

The Dairy Herd Association Improvement Program in Arizona ran their own six-month evaluations on feeding Diatomaceous earth at **Hussey Farms in Litchfield Park Arizona**. Their test group showed an increase of 20% in production with the butter-fat content remaining the same. Warbles problems came to an abrupt halt and Feed Assimilation and fly problems were brought under control. Similar results were found at the trials when evaluating the 100 dairy cows at the **Bunker Farms, in Mesa Arizona**. At **Daniel M. Brandt's farm in McFarland, Wisconsin** mastitis problems were brought under control and Butterfat tests showed an increase from 3.7 to 3.9. Organ analysis of Dairy Cattle done by the **Michigan Dept. of Agriculture** fed D.E. over a five-year period showed no visible organ abnormalities. Diatomaceous earth is also an effective parasitical and deodorizer when feed to swine. Reductions in scours have also been noticed in field trials of feeding D.E. to weanling pigs. **M.F. Petty DVM Alabama** noticed the following reductions and improvements to the test group in his field trial: 1) No internal parasites after seven days of the D.E. 2) Hogs stopped rooting and destroying wooden feeders 3) Odour reductions were very noticeable 4) Fly populations were markedly decreased.

Diatomaceous Earth in the feed for other Animals

D.E. has been used by sheep farmers in New Zealand for years as a parasitical and for improvements in digestive processes and feed efficiency. Ratite breeders have also found benefits to using diatomaceous earth for controlling parasites, odours and as a dust bath for fleas and mites in the feathers. Dog Food manufacturers are also aware of the benefits of adding Diatomaceous Earth to their rations. In small amounts, D.E. has shown effectiveness against Ascarids, Hookworms and Whipworms, in trials done at the **Midland Animal Clinic in Midland, Texas**. Zoo animals also respond in a similar way to the introduction of D.E. into their diets. The **John Ball Park, Grand Rapids, Michigan, Brookfield Zoo of Chicago** and **Buffalo Zoo of Buffalo New York** all reported that their black bears had a healthier overall appearance and clearer eyes. The Brookfield Zoo also noticed a pronounced improvement in feeding and behaviors in their primates. Total absence of any internal parasites was also noted at each zoo.

Sources:

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