Anima Sanum Is Of Great Help in the Poultry Industry in the Following Ways:

- **Increases Food Efficiency Values / Lower Feed Conversion Rates**
- **Increased Pellet Durability for Feeds**
- **Healthier Birds**
- **Reduces Diarrhea**
- **Mycotoxins Binder**
- **Reduces Foot Pad Burns From Phosphorus**
- **Lowers Mortality**
- **Lesser or No Antibiotics**
- **Increased Number of Gradable Eggs**
- **Increased Shell Thickness**
- **Flow Agent / Anti-caking Agent**

- **Increases Solubility of Phosphate in Birds**
  The zeolite exchanges the calcium from dicalcium phosphate and makes the phosphate more soluble and better utilized by the bird for bones. The dicalcium phosphate in the feed may be reduced by 50% after testing.
- **Increased Nitrogen Content of Manure and Compost**
  Anima Sanum increases and fixes the nitrogen in the manure and compost so that it is plant accessible but not water-soluble. It stops the gassing of the nitrogen as ammonia. Good chicken compost should sell for $75.00 to $90.00 per ton. Many of the areas that have been repeatedly fertilized with chicken manure now have phosphate problems. This is a result of not enough nitrogen to balance the plant uptake of the phosphorous. The problem can be solved by increasing the nitrogen, by the addition of phytase to the feed, and by feeding Anima Sanum to solubilize the phosphate in the bird.
- **Zeolites Adds Value to Manure and Compost**
  The introduction of Zeolites with the manure or compost to the soil has the benefit of increasing water retention, holding the nitrogen and other nutrients in the growth zone, provides a medium for the future capture of nitrogen, increases the ion exchange capacity of the soil, provides potassium and calcium, and enhances infiltration and aeration of the soil. Anima Sanum is a value added soil amendment that should be advertised as such.
- **Odor Control**
  Reduces the ammonia gas and odor in the coop and manure storage and compost areas.
- **Fly Control**
  Reduced ammonia gas and increased moisture absorption helps control flies.
- **Increased Animal Welfare**
  Greater animal health creates better animal welfare, better products, greater production, and less usage of antibiotics and medicines that may have lasting adverse effects to the human population.
- **Groundwater Pollution Control**
  Fixing the nitrogen and various heavy metals reduces the pollution of the groundwater with nitrates and nitrites.
- **Recycle Egg Wash Water**
  Egg wash water can be recycled after filtration through a bed of zeolite granules to remove suspended solids and bacteria (e.g. E. Coli, etc.)

Methods for Obtaining These Benefits Include:

1. Adding to Feed

This is the most effective point of addition. Many farms have eliminated most of their odor and realized greater animal health, welfare, and production by feeding between 1⁄2 to 2% of the total ration on a weight basis of Anima Sanum. A -40 mesh product should be fed in mash or a -100 mesh should be used to pelletize supplements.

2. Applying to Bedding Area

A thin layer should be applied to the bedding area or to the area that receives the manure each time it is cleaned out

In Compost or Dry Stacked Manure

The compost or dry stacked manure should be "top dressed" with a thin layer of Bedding Sanum after it is turned or after the addition of a new layer of manure. Alternatively, a layer of Bedding Sanum should be placed in the area of the barn receiving the fresh manure. Composting is an important process that:

1. Converts organically bound nitrogen that is not plant accessible to ammonium hydroxide, ammonium nitrate, and ammonia that then are plant accessible.
2. Kills the pathogens.
3. Reduces or eliminates the odor.
4. Dries the manure.
5. Reduces the flies.
6. Kills weed seeds.

Composting should be conducted "in vessel" to prevent groundwater and air pollution. Wash down operations are no longer environmentally acceptable due to groundwater pollution of nitrates, nitrites, and hydrogen sulfide.

Research papers and abstracts

Using clinoptilolite from the Itaya r-nine,Yamagata Prefecture, and mondenite fromKarawago, Miyagi Prefecture, Onagi foundthat Leghorn chickens required less food andwater and still gained as much weight in a 2-week trial as birds receiving a control diet.Feed efficiency values (FEV)l were markedlyhigher at all levels of zeolite substitution; feedstuffscontaining 10 percent zeolite gave riseto efficiencies more than 20 percent greaterthan those of normal rations (table 4). Adverseeffects on the health or vitality of the birds werenot noted, and the droppings of groups receivingzeolite diets contained up to 25 percent lessmoisture than those of control groups, after a12-day drying period, making them considerably easier to handle.Broiler chickens fed a diet of 5 percent Clinoptilolite from the Hector, CA, deposit gainedslight1y 1ess weight over a 2-month period thanbirds receiving a normal diet, but average FEVSwere noticeably higher (table 5). Perhaps ofgreater significance is the fact that none of the48 test birds on the zeolite diet died during theexperiment, while 3 on the control diet and 2on the control diet supplemented with antibioticssuccumbed. In addition to an apparentfeed-efficiency increase of 4 to 5 percent, thepresence of zeolite in the diet appears to havehad a favorable effect on the mortality of thebirds.

Table 4.—Caloric Efficiencies of Zeolite Supplements in poultry Feeding[a]

Group no.	Zeolite content of rations	Average starting wt. (g)	Average final wt. (g)	Average weight gain (g)	Average feed intake[b] (g)	Feed efficiency ratio[c]
1	10 percent Cp[d]	553.7	795.6	241.9	668	0.362
2	5 percent Cp	540.7	778	237.3	697	0.340
3	3 percent Cp	556.7	796	239.3	748	0.320
4	10 percent Mo	532.3	757.3	225.0	634	0.355
5	5 percent Mo	552.3	814.6	262.3	775	0.338
6	3 percent Mo	534.5	791.3	256.8	769	0.334
7	Control	556.5	789.3	232.8	782	0.298

aOnagi (1966) Tests carried out on 48-day-old Leghorns over a 14-day period, 30 birds/group. Normal rations consisted of 16.5 Percent crude Protein and 66 Percent digestible nutrients
[b]Excluding zeolite.
[c]Feed efficiency - weight gain/feed intake (excluding zeolite).
[d] Cp = clinoptilolite, Mo - mordenite.

Table 5.—Apparent Caloric Efficiency of Zeolite in Chicken Rations[a]

Treatment of	Average weight (g)	Average consumption (g)	Average F.E.V.[c]	Survivors of 48 birds
	4-week data[d]			
Control diet	730	1175	0.622	46
Control diet + antibiotics	708	1116	0.634	47
Control diet with 5 percent clinoptilolite	703	1070	0.657	48
	8-week data[f]			
Control diet	1869	3978	*0.470*	*45*
Control diet + antibiotics	1882	3869	*0.486*	*46*
Control diet with 6 percent clinoptilolite	1783	3647	*0.489*	*48*

aAdapted from data of Arscott (1975)
bFeed consumed, excluding zeolite
cFeed efficiency value = weight/feed consumed (excluding zeolite)
dStarter rations (O to 4 weeks)
e55 ppm zinc bacitracin
fFinisher rations (4 to 9 weeks)

Effect of zeolite (clinoptilolite) as feed additive in Tunisian broilers on the total flora, meat texture and the production of omega 3 polyunsaturatedfatty acid

Zouhir Mallek1,2, Imen Fendri2, Lamia Khannous2, Amal Ben Hassena2, Al Ibrahim Traore3, Mohamed-Ali Ayadi4 and Radhouane Gdoura2,5*

Background: Increasing consumer demand for healthier food products has led to the development of governmental policies regarding health claims in many developed countries. In this context, contamination of poultry by food-borne pathogens is considered one of the major problems facing the progress of the poultry industry in Tunisia.

Result: Zeolite (Clinoptilolite) was added to chicken feed at concentrations 0,5% or 1% and was evaluated for its effectiveness to reduce total flora in chickens and its effects on performance of the production. The broilers were given free and continuous access to a nutritionally non-limiting diet (in meal form) that was either a basal diet or a' zeolite diet' (the basal diet supplemented with clinoptilolite at a level of 0,5% or 1%). It was found that adding zeolite in the broiler diet significantly ($p < 0,05$) reduced total flora levels, as compared to the control, on the chicken body. In addition, it was found that zeolite treatment had a positive effect on performance production and organoleptic parameters that were measured and mainly on the increase level of Omega 3 fatty acid.

Conclusion: This study showed the significance of using zeolite, as a feed additive for broilers, as part of a comprehensive program to control total flora at the broiler farm and to increase level of Omega 3 fatty acid on the chicken body.

The Effect of a Natural Zeolite (Clinoptilolite) on the Performance of Broiler Chickens and the Quality of Their Litter*

X. Karamanlis**, P. Fortomaris, G. Arsenos, I. Dosis, D. Papaioannou, C. Batzios and A. Kamarianos. Department of Animal Production, Ichthyology, Ecology and Protection of Environment,Faculty of Veterinary Medicine, Aristotle University of Thessaloniki, 54124 Thessaloniki, Greece

ABSTRACT : The objective of this study was to assess the effect of clinoptilolite (a natural zeolite) on growth and performance ofbroilers as well as on the quality of their litter. A total of 5,200 one-day old broiler chickens (Cobb 500) were used in two consecutiverounds lasting 42 days each. The broilers were given free and continuous access to a nutritionally non-limiting diet (in meal form) thatwas either a basal diet (B) or a 'zeolite diet' (Z; the basal diet supplemented with clinoptilolite at a level of 2%). A 2×2 factorial designconsisted of two feeding treatments (B and Z) and two bedding types, sawdust (S) and sawdust with zeolite (Sz, which was the result ofadding 2 kg zeolite/m2), was used. In each round the broilers were randomly assigned to one of four (n = 650), treatment groups: two fedon the basal diet (B) and had bedding of either sawdust (group BS) or sawdust and zeolite (group BSz) and two fed on the Z diet and hadas bedding either sawdust (ZS) or sawdust and zeolite (ZSz). Average growth rates were significantly ($p<0.05$) different between broilersof different groups; broilers that were fed on the 'zeolite diet' (Z) and were placed either in a compartment with sawdust bedding orsawdust bedding and zeolite (ZS and ZSz) as well those that were fed on the basal diet in a compartment with sawdust bedding andzeolite (BSz) grew at a faster rate ($p<0.05$) compared with those of the control group (BS). The incorporation of NZ in broilers diets andin their bedding material decreased the organic content in litter samples throughout the experimental period. The lowest organic contentwas recorded in groupZSz where NZ was added in both feed and litter. Mean ammonia concentration (ppm) was significantly higher ingroup ZS in comparison to groups BSz and ZSz (27.00 vs. 20.55 and 21.71 respectively). The results of this study showed that theincorporation of the clinoptilolite both in feed and into the litter had a positive effect on broiler growth and also on the quality of theirlitter. (Key Words: Broilers, Clinoptilolite, Performance, Litter Quality)

Aflatoxin Control in Poultry

A research study reveals zeolite to be effective and more than offsets the detrimental effects of feeding aflatoxin contaminated feed. Broilers fed 10kg of zeolite per ton (1%) of finished feed containing 115 ppm of aflatoxin showed improved feed conversion by 5.8 points and the body weight by 5.3 points versus the 115 ppm aflatoxin control feed. Broilers fed the zeolite rations containing 115ppm aflatoxin had a lower feed conversion by 1.1 points and higher body weight by 3.7 points than the broilers fed rations containing no zeolite and no aflatoxin.

Use of natural zeolite-supplemented litter increased broiler production

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H. Eleroğlu1 and H. Yalçın2#

[1]Cumhuriyet University, ŞarkışlaAşıkVeysel Vocational High School, 58400 Sivas, Turkey

[2]Cumhuriyet University, Department of Geological Engineering, 58140 Sivas, Turkey

Abstract

The aim of this study was to ascertain the influence of natural zeolite, consisting mainly of clinoptilolite and mordenite, as a component of the litter material in broiler houses on the performance of the broilers and on some litter characteristics. Live weight gain, feed consumption, feed efficiency, viability and leg and body abnormalities of broilers, and litter moisture content were measured during a six-week experimental period. A broiler house was divided into 12 sections using 1 m high duralite partitions that prevented air exchange between sections and stocked with 15 birds/m2. Natural zeolite was added to wood shavings at levels of 0% (control), 25%, 50% and 75% of total litter volume. Litter thickness was 5 cm in all groups. The addition of zeolite at all levels improved broiler performance significantly above the control. At the end of the six-week trial zeolite did not affect feed consumption significantly, (g), 3547, 3381, 3472 and 3421, but resulted in higher live weights of the broilers of from 1935 g in the control to 1970, 1996 and 1978 g for the respective zeolite treatments. Consequently, feed efficiency improved significantly from 1.83 g feed/g gain in the control to 1.71, 1.74 and 1.73 g feed/g gain in the respective zeolite treatments. No differences between treatments were recorded in vitality or in leg and body abnormalities in the chickens. Litter moisture content decreased from 36.2% in the control to 25.2, 23.6 and 21.8% in the respective zeolite treated litter. It is concluded that the inclusion of zeolite material to litter positively affected broiler performance, poultry house conditions and litter moisture content. An inclusion rate of up to 25% zeolite is recommended in litter consisting of wood shavings.