



Antibiotic-Free
Mold Inhibitor
Pathogen Eliminator

Why Sano Products
Are The Answer

Lancom Bio Pharm
16 Jarvis Court, Fairfield, CT 06824 - USA
P 203-767-6000



The most cost-effective means of ridding pathogens from the world's supply of beef, poultry and eggs is... to eliminate the pathogens before they get to the processing plants.

"Recent laboratory studies and observations by owners and supervisory personnel in both broiler and egg production units, have shown that LANCO SANO can act to prevent the colonization of salmonella and Escherichia coli, and perhaps other potential poultry pathogens, in broilers and laying hens."

The answer: Lanco Sano Products



Mold Inhibitor

Lanco Sano product, both in the liquid and dry application, is recognized by the FDA as GRAS (generally regarded as safe)

"...the LANCO SANO products show to have a much wider scope of effectiveness (beyond curbing or inhibiting mold in feed) in... eliminating other dreaded microorganisms such as E. coli and Salmonella."

Pathogen Elimination

These same producers who are using LANCO SANO products as feed mold inhibitors are also experiencing pathogen elimination which has resulted in significantly higher yields and production, decreased mortality and processing costs.

And it is antibiotic-free



Field tests have (been) conducted for five years on lanco sano -dry with excellent results in controlling and eliminating E.coli and Salmonella. I am excited about the future for this product in the (livestock) industry.

Non-Corrosive Benefits

Lancom's Sano product has a high-ph, **protects** your equipment from corrosive damage – unlike other acidic products currently on the market.



LANCO SANO: Lab Results

The Protocol

Each organism is heavily inoculated on appropriate media for growth:

- A. Bacteria (Tryptose Agar)
- B. Molds and Yeast (Sabouraud Agar)
- C. A Sterile Blank paper disk is saturated with the test sample. The disk (7mm) is placed on the surface of the inoculated plate. Gently tapping the disk assures its contact with the plate media.
- D. The plates are then incubated at 35 degrees Celsius for 24 hours (bacteria) and 48 hours for (mold and yeast).
- E. The size of the zone of inhibition is then measured in millimeters at the end of the incubation. Notice that all of the inhibition measured outside of the disk.

Results:

1. E. Coli	19.6
2. Salmonella SPP	22.0
3. Aspergillus Flavus	16.0
4. Candida SPP	15.6
5. Beta Hemolytic Streptococci	19.0
6. Pseudomonas (Toxic Org)	12.0
7. Pasteurella Multocida	11.0
8. Avian Klebsiella	12.0

Tests were run on the following organisms:

1. E. Coli
2. Salmonella SPP
3. Aspergillus Flavus
4. Candida SPP
5. Beta Hemolytic Streptococci
6. Pseudomonas and Pasteurella Multocida
7. Avian Klebsiella



BATTERY TESTS: RESULTS

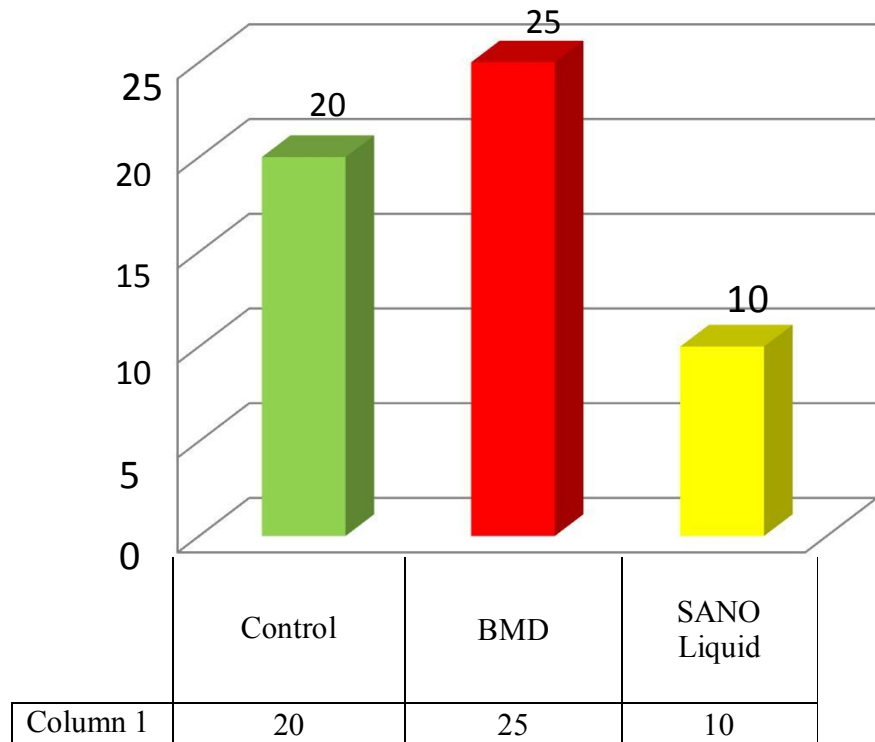
In this experiment, commercial broiler chicks were dosed with an aggressive Salmonella strain at 10 days of age while being fed one of three feeds including an un-medicated control, the same feed with a commonly-used feed additive or four pounds per ton LANCO SANO Liquid. No growth trends were noted across treatments.

- Birds fed LANCO SANO liquid showed lower Salmonella colonization in the ceca (indicating less gut Salmonella)
- No indications of Salmonella in the spleen (indicating no crossing of Salmonella into the blood stream) as compared to the other treatments.



From Cecal Salmonella Colonization (%)

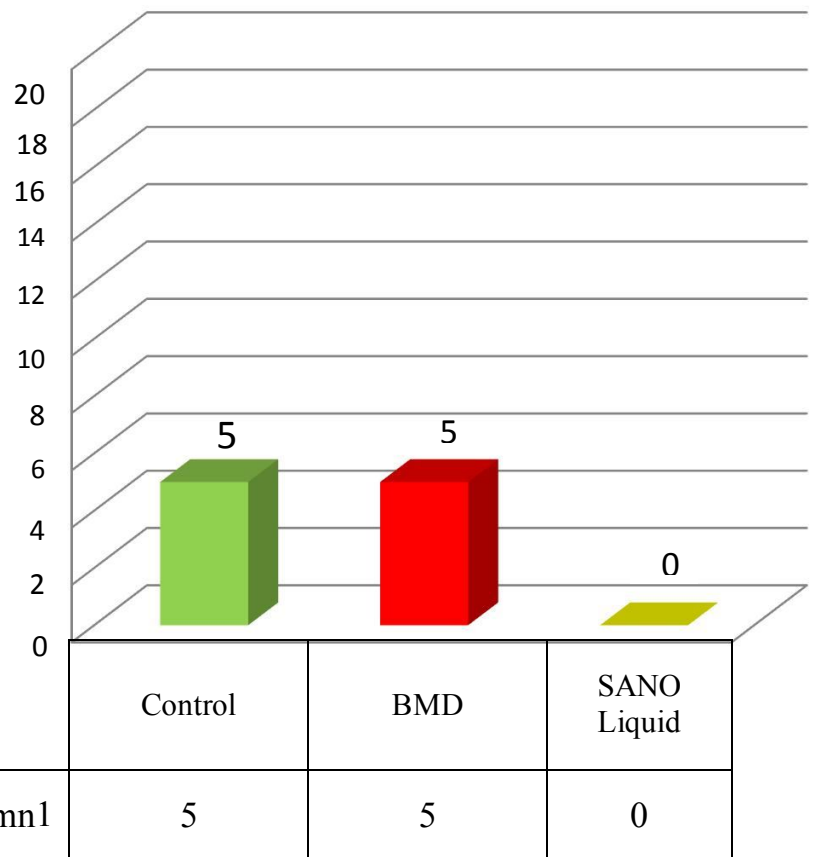
Percent Salmonella Colonization





Spleen Salmonella Colonization (%)

Percent Salmonella Colonization



0% Salmonella in the Spleen

0% Salmonella in blood.

Column1	5	5	0
---------	---	---	---



The following were tests conducted by
James McNaughton, Ph.D.
PARC Institute, Inc.
Easton Maryland



FROM THE EXPERTS





Protocol: To evaluate LANCO SANO-LIQUID as a growth promoter for broilers when placed in a controlled non-stress condition

Start Date: August 3, 1995
Completion: August 24, 1995



Effect of SANO-LIQUID on Broiler Performance

Feeds: Broiler feeds will be prepared by PARC Institute, Inc.

A control feed containing all the known requirements will be formulated by PARC and mixed all at one time and a portion (1/3) will be taken from the control to which all products will be added. This procedure will assure that all rations contains the same proportion of major ingredients. The diets confirm to industry standards and meets or exceeds the nutritional requirements set forth : Nutrient Requirements of Poultry, 9 rev. ed. National Research Council, 1994.

Data To Be Collected

- Body Weights - day 21
- Feed Efficiency (days 1-21)
- Mortality (days 1-21)

SANO-LIQUID LEVEL #TON	BODY WEIGHT (#)	FEED : GAIN	MORTALITY (%)
0.00	1.337 a	1.469 a	5.00 a
0.50	1.340 a	1.458 a	8.00 a
1.00	1.352 a	1.454 a	6.00 a
2.00	1.354 a	1.446 a	2.00 a

Note: Means within a column without a common superscript are significantly different (P<.05) as determined by LEAST SIGNIFICANT DIFFERENCE. No significance was found.

Data Summary: Broilers were reared 1-21 days of age in battery unity that were thoroughly cleaned and sanitized. After feeding each treatment feed for 21 days, the data was recorded and analyzed as above. Although no significant difference was found when broilers were reared under sterile conditions, a strong trend was found toward increased growth and feed conversion (feed:gain) when LANCO SANO LIQUID was fed.

Objective: A trial was conducted to determine if LANCO SANO LIQUID will reduce and/or eliminate field varilant strains of E. coli (Escherichia Coli).



LANCO SANO-LIQUID STUDY

E. coli sensitivity

Incidence and Distribution

Various strain of E. coli probably infect most mammals and birds. Clinical disease is reported most often in chickens, turkeys and ducks.

Justification for Research:

Escherichia coli infections include colibacillosis, colisepticemia, Hjarre's disease, coligranuloma, peritonitsis, salpingitis, synovitis, omphalitis, air sac disease, and all other disease conditions caused entirely or partly by E. coli.

Collectively, these diseases are responsible for significant economic losses to the poultry industry. The various serotypes are intestinal inhabitants of all animals; therefore, their distribution is widespread. Avian strains of E. coli are not recognized as important causes of infections in other animals, including man. Most serotypes isolated from poultry are pathogenic only for birds.

E. Coli is a common inhabitant in the intestinal tracts of animals at a concentration of 10^0 /g or less. In presence in drinking water is considered indicative of fecal contamination.

- Among normal chickens, 10-15% if intestinal coliforms belong to potentially pathogenic serotypes. Intestinal strains are not necessarily the same serotype as those form the pericardial sac of the same bird.
- Egg transmission of pathogenic E. coli is common and can be responsible for high chick mortality.
- Pathogenic coliforms are more frequent in the gut of newly hatched chicks than in eggs from which they hatched, which suggests rapid spread after hatching.
- The most important source of egg infection seems to be fecal contamination of the surface with subsequent penetration of the shell and membranes.
- Coliform bacteria can be found in litter and fecal matter.

LANCO SANO-LIQUID STUDY
 E. coli sensitivity
 continued:



PROCEDURE

- A field varilant strain of E. coli obtained from a farm on Delmarva was collected and populated on MacConkey Agar plates.
- E. coli was placed on the feeds at a concentration of 10^6 per gram.
- Confirmation of E. coli was performed by AP120E system. (bioMerieux Vitek, Inc.) using the anaytical profile index.
- LANCO SANO LIQUID was placed in each 50# feed sample in the following manner:

Dust in poultry houses may contain 10^5 - 10^6 E. coli/g. These bacteria persist for long periods, particularly when dry. There was a reduction of 84-97% in 7-days following wetting of dust with water. Feed is often contaminated with pathogenic coliforms that can be destroyed by hot pelting. Rodent droppings ofen contain pathogenic coliforms. Pathogenic serotypes can also be introduced into poultry flocks through contaminated well water. E. Coli is a gram – negative, nonacidfast, uniform-staining, nonspore-forming bacillus, usually 2-3x0.6mm. The organism may be variable in size and shape. Many strains are motile and have peritichous flagella.

TREATMENT added rate	LANCO SANO LIQUID (#/ton)
Control (None Added)	0
LANCO SANO-LIQUID	.5
LANCO SANO-LIQUID	1
LANCO SANO-LIQUID	2
LANCO SANO-LIQUID	3

- Each sample was mixed thoroughly and allowed to set for two hours.
- E. Coli was determined by taking 10 swabs from 10 different areas of the 50# sample
- Each swab was placed on a separate MacConkey plate and incubated at 37°C for 24 hours.
- Each positive (+) culture was confirmed by AP120E.

LANCO SANO-LIQUID STUDY E. coli sensitivity RESULTS



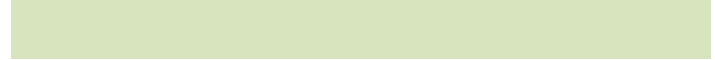
TREATMENT	SWAB	E. COLI POSITIVE+ NEGATIVE -
CONTROL	1	+
	2	+
	3	+
	4	+
	5	+
	6	+
	7	+
	8	+
	9	+
	10	+
LANCO SANO LIQUID (0.5 #/ton)	1	+
	2	-
	3	-
	4	+
	5	-
	6	-
	7	+
	8	+
	9	-
	10	-

LANCO SANO-LIQUID STUDY E. coli sensitivity: RESULTS

TREATMENT	SWAB	E. COLI POSITIVE+ NEGATIVE -
LANCO SANO LIQUID (1.0 #/ton)	1	-
	2	-
	3	-
	4	-
	5	-
	6	-
	7	-
	8	-
	9	-
	10	-

LANCO SANO LIQUID (2.0 #/ton)	1	-
	2	-
	3	-
	4	-
	5	-
	6	-
	7	-
	8	-
	9	-
	10	-

TREATMENT	SWAB	E. COLI POSITIVE+ NEGATIVE -
LANCO SANO LIQUID (3.0 #/ton)	1	-
	2	-
	3	-
	4	-
	5	-
	6	-
	7	-
	8	-
	9	-
	10	-



Conclusion:

LANCO SANO LIQUID appears to destroy E. coli at a minimum rate of 1 #/ton.



LANCO SANO LIQUID Salmonella Elimination

Justification for Research

Salmonella is occasionally found in meat sources used in poultry and dairy cattle rations. The total elimination is essential to prevent contamination of the feed mill, the potential health hazard of both poultry and dairy cattle, and potentially contaminating the processing plant and finished product to the consumer. Salmonella is responsible for significant economic losses to the poultry and dairy industry. Public demands for irradiation of salmonella contamination of mainline foods for humans has recently gained momentum. Total Salmonella irradiation through the reduction of meat sources contaminated with salmonella is impossible, therefore, a resurgence of emphasis in methods of salmonella contamination, particularly sources, and, more importantly, METHODS OF DESTROYING SALMONELLA IN FEED USED IN ANIMAL RATIONS.

Objective

A trial was conducted to determine if LANCO SANO LIQUID will reduce and/or eliminate field varilant strains of Salmonella found in meat sources used in poultry and dairy cattle rations.

Literally 100's of salmonella strains are found in various sources. However, from a public viewpoint, the strain of salmonella is unimportant.

The important goal is TOTAL ELIMINATION.

LANCO SANO LIQUID Salmonella Elimination Procedure



TREATMENT	LANCO SANO LIQUID ADDED RATE (#/TON)
Control (none added)	0
LANCO SANO LIQUID	1
LANCO SANO LIQUID	2

1. A field strain of salmonella found in a meat source used in poultry and dairy feeds was collected and allowed to popugate for four days at 37⁰ C.
2. Confirmation of Salmonella was performed by API20E system (bioMerieux Vitek, Inc.)
3. LANCO SANO LIQUID was placed in each 50# meat source sample in the following manner.
4. Each sample was mixed thoroughly and allowed to set for 24-hours
5. Salmonella was determined by taking 10 swabs from 10 different areas of a 50# sample
6. Each swab was placed in a separate MacConkey plate and incubated at 37⁰ C
7. Each positive (+) culture was confirmed by AP120E

LANCO SANO LIQUID Salmonella Elimination Procedure



Salmonella Contamination
After 24-hours
Positive + Negative -

TREATMENT	SWAB	TRAIL 1	TRAIL 2	TRAIL 3
CONTROL	1	POSITIVE	POSITIVE	POSITIVE
	2	POSITIVE	POSITIVE	POSITIVE
	3	POSITIVE	POSITIVE	POSITIVE
	4	POSITIVE	POSITIVE	POSITIVE
	5	POSITIVE	POSITIVE	POSITIVE
	6	POSITIVE	POSITIVE	POSITIVE
	7	POSITIVE	POSITIVE	POSITIVE
	8	POSITIVE	POSITIVE	POSITIVE
	9	POSITIVE	POSITIVE	POSITIVE
	10	POSITIVE	POSITIVE	POSITIVE

LANCO SANO LIQUID Salmonella Elimination Procedure



Salmonella Contamination
After 24-hours
Positive + Negative -

TREATMENT	SWAB	TRAIL 1	TRAIL 2	TRAIL 3
CONTROL	1	POSITIVE	NEGATIVE	NEGATIVE
LANCO SANO LIQUID	2	POSITIVE	NEGATIVE	NEGATIVE
1 LB/TON	3	NEGATIVE	NEGATIVE	NEGATIVE
	4	NEGATIVE	NEGATIVE	NEGATIVE
	5	POSITIVE	NEGATIVE	NEGATIVE
	6	NEGATIVE	NEGATIVE	NEGATIVE
	7	POSITIVE	NEGATIVE	NEGATIVE
	8	POSITIVE	NEGATIVE	NEGATIVE
	9	POSITIVE	NEGATIVE	NEGATIVE
	10	NEGATIVE	NEGATIVE	NEGATIVE

LANCO SANO LIQUID Salmonella Elimination Procedure



Salmonella Contamination
After 24-hours
Positive + Negative -

TREATMENT	SWAB	TRAIL 1	TRAIL 2	TRAIL 3
CONTROL	1	NEGATIVE	NEGATIVE	NEGATIVE
2 LB/TON	2	NEGATIVE	NEGATIVE	NEGATIVE
	3	NEGATIVE	NEGATIVE	NEGATIVE
	4	NEGATIVE	NEGATIVE	NEGATIVE
	5	NEGATIVE	NEGATIVE	NEGATIVE
	6	NEGATIVE	NEGATIVE	NEGATIVE
	7	NEGATIVE	NEGATIVE	NEGATIVE
	8	NEGATIVE	NEGATIVE	NEGATIVE
	9	NEGATIVE	NEGATIVE	NEGATIVE
	10	NEGATIVE	NEGATIVE	NEGATIVE

LANCO SANO LIQUID

Salmonella Elimination Procedure



Results of Salmonella detection on a salmonella positive blended meat source used in poultry and dairy cattle rations when plated on MacConkey method.

Positive = More than one colony found on MacConkey after 24 hours

Negative = No colonies found on MacConkey Plate after 24 hours

Trials conducted by PARC Institute, Inc. Easton, Maryland

TREATMENT	TRIAL 1		TRIAL 2		TRIAL 3	
	Before	After	Before	After	Before	After
LANCO SANO LIQUID	Positive	Positive	Positive	Negative	Positive	Negative
LANCO SANO LIQUID	Positive	Negative	Positive	Negative	Positive	Negative

Conclusion

LANCO SANO LIQUID appeared to destroy salmonella at a minimum rate of 1 #/ton in two of three trials. Trial 1 had 6/10 samples that were salmonella positive (POS). However in Trials 2 and 3 all samples were negative (NEG). Our conclusion was that samples may not have been mixed thoroughly in Trial 1 and; therefore, LANCO SANO LIQUID did not have an adequate opportunity to act. LANCO SANO LIQUID added at a rate of 2 pounds per ton appeared to eliminate ALL salmonella in all trials.



LANCO SANO-LIQUID

Feed Preservative

Ingredients:

Sodium Phosphate, Water, Sodium Silicates, Acetic Acid

Directions For Use

Use 0.5 to 1.5 kg. per ton of finished feed or apply to grain. Intended for use in animal feed for the protection of processed feed against spoilage

Caution

Eye irritation first aid. If in the eyes, flush with plenty of water for 15 minutes.

If swallowed, drink plenty of water.

5 gallon pail (19 liters)

330 gallon drum (1247 liters)

Bulk

LANCOM BIO PHARM

16 Jarvis Court, Fairfield, CT 06824- USA

P 203-767-6000