

# Bentoli<sup>®</sup> CONNECT

Issue: January 2021

## Inside News

### Bentoli R & D team under the leadership of Prof.Dr. Mayilraj Shanmugam & Ms Caroline Sophia Raj studied Propionic acid Mold Inhibition Equivalent (PMIE) Value of Amonex<sup>®</sup> Active Liquid

Bentoli R & D team headed by Prof.Dr. Mayilraj Shanmugam, Director of research, an eminent microbiologist, UNESCO Fellow, DFG Fellow, Raman Fellow, DAAD Fellow, JSPS Fellow developed the method to study Propionic acid Mold Inhibition Equivalent (PMIE) of organic acid-based mold inhibitor, Amonex<sup>®</sup> Active Liquid and team found the average PMIE value of Amonex<sup>®</sup> Active Liquid as 72.675% which would be the best efficacy of product through in-vitro study. Ms. Caroline Sophia Raj, Senior Manager, Formulation and Product Development was instrumental in PMIE study.



Dr. Shanmugam Mayilraj

The study method is developed in house where "Disc Diffusion Method", was used to validate the Propionic Acid Mold Inhibition Equivalent of Amonex<sup>®</sup> Active Liquid by comparing the product against (10, 30, 40, 50, 60, 7 and 100%) of propionic acid in the effectiveness in inhibiting four molds, namely, *Aspergillus flavus*, *A. niger*, *Penicillium verrucosum* and *Fusarium culmorum*.

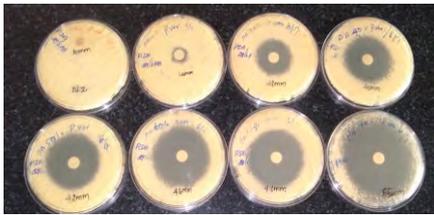
Amonex<sup>®</sup> Active Liquid is latest generation mold inhibitor powered by PMIE technology. Basically, Propionic acid Mold Inhibitor Equivalent (PMIE) is a quotient developed internally by Bentoli to indicate the anti-mold efficacy of an organic acid, organic salts and formulated products for mold inhibition that is expressed as an equivalent to the mold inhibition effect of propionic acid. For example, when a product's PMIE is expressed as 60%, that means the product works as effectively as 60% concentration of propionic acid in short-term mold inhibition. Following is the few glimpses of the study and report which may give you some insights about the PMIE



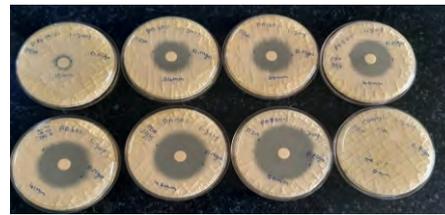
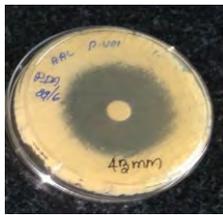
Ms Caroline Sophia Raj

Test organism	PA 10%	PA 30%	PA 40%	PA 50%	PA 60%	PA 70%	PA100%	AAL	PMIE of AAL
<i>Aspergillus flavus</i>	15	29	33	35	38	42	50	33	66.0
<i>Aspergillus niger</i>	15	34	35	40	41	43	50	40	80.0
<i>Fusarium culmorum</i>	24	40	49	53	55	58	63	42	66.6
<i>Penicillium verrucosum</i>	14	31	40	42	46	47	55	43	78.1

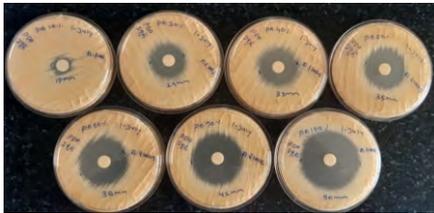
Average value 72.675



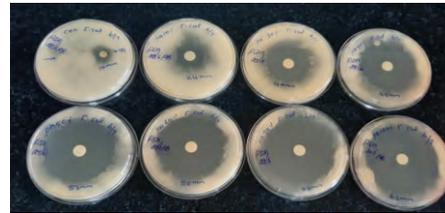
Inhibitory test of different concentrations of propionic acid & Amonex® Active Liquid on *Penicillium verrucosum*



Inhibitory test of different concentrations of propionic acid & Amonex® Active Liquid on *Aspergillus niger*



Inhibitory test of different concentrations of propionic acid & Amonex® Active Liquid on *Aspergillus flavus*



Inhibitory test of different concentrations of propionic acid & Amonex® Active Liquid on *Fusarium culmorum*



# Amonex® Active Liquid

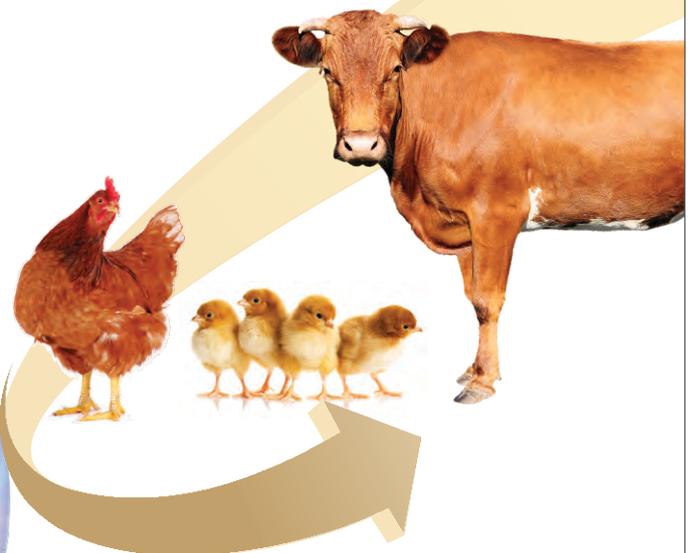
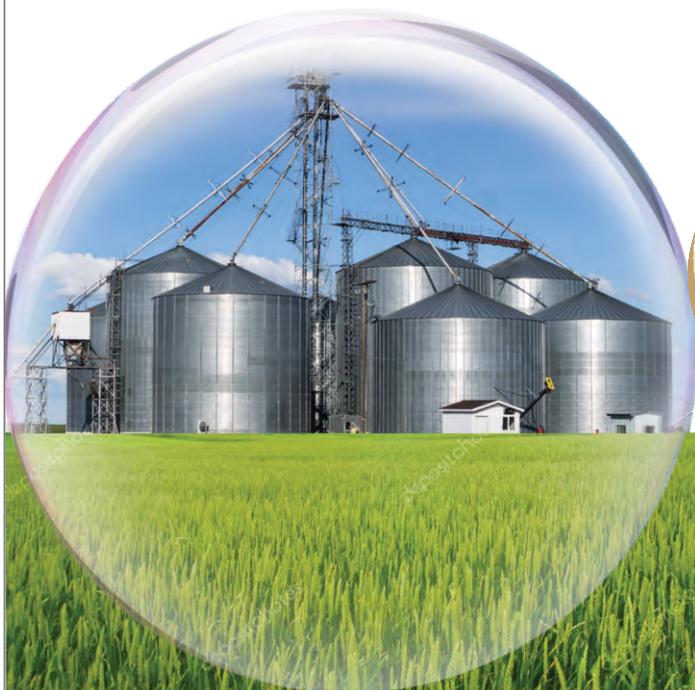
PRESERVATION

## KEY FEATURES & BENEFITS

- 1 Inhibits a wide range of molds  
Lower pungency and corrosiveness allows easier handling of the product and reduced wear and tear of equipment
- 2
- 3 Prolongs shelf-life of feeds and grains
- 4 Preserves nutritional quality of feeds and grains

- Advanced generation mold inhibitor formulated on propionic acid mold inhibition equivalent (PMIE)
- Broad-spectrum mold inhibition
- Long action
- Lower pungency
- Lower corrosion

- 5 Minimizes the risk of mycotoxin production in feeds and grains during storage
- 6 Increases flexibility in moisture management of feeds and grains



# Mycotoxins - a serious problem in swine Farming

Dr. Winai Thongmak, *Swine nutrition & Farm management Expert;*  
*Live Informatics Co.,Ltd, Thailand*



## Part-2

The pigs that receive mycotoxin through feed could be hard to identify only by clinical symptoms. Along with clinical investigations, there is need of testing feed samples collected from suspected farm.

We should know more about the symptoms related to each mycotoxin. Sometimes it is very difficult to separate out exact causative mycotoxins due to interlink effects in terms of pathophysiology caused by several mycotoxins.

- **Aflatoxin**

In nursery piglets the symptoms are not clear. In continuous exposure to low level of aflatoxins, piglets are found not growing as per standard, less muscular growth and exhibit pale yellow skin. It becomes very difficult to identify the reason until feed is tested positive for aflatoxin contamination. Exposure to low level of aflatoxin for prolong period specially in low protein diet is evident through un-uniform size and growth of the piglets from same litter.

In pigs exposed to medium to high levels of Aflatoxin show symptoms of immunosuppression and pigs become susceptible to diseases of any kind. Medium to high exposure to aflatoxin in piglets may result into seizures, sometimes may be confused with Pasteurellosis and Actinobacillus pleuropneumonia (APP) diseases.

In pregnant sows aflatoxin may affect the liver and there is high risk of abortion. In lactating sows aflatoxicosis affects the milk yield and when the milk is fed to suckling piglets may cause piglet diarrhea which is sometimes confused with streptococcal infection and the condition remains nonresponsive to antibiotic treatment.

- **Ochratoxin**

Ochratoxin is a cause of kidney damage resulting into insufficient excretion of nitrogenous waste and urine output. Clinically condition could be identified by seeing the symptoms like yellow urine and abnormal odour, rough coat which is very similarly to salmonella infection or swine cholera. Laboratory diagnosis which reveals high urea in blood along with feed analysis for ochratoxin may confirm the case of ochratoxin toxicity.

- **Fumonisin**

Fumonisin influences sphingomyelin metabolism and direct effect to the liver, lung. The swine received a high dose of fumonisin, has a severe cough and sickness, pale and yellow skin, nonresponsive to antibiotic therapy. Normally we found the swine with symptoms like respiratory disease and happen in the farm while high percentage of corn is used in formula. As a specialist we must take fumonisin as a reason to consider when we found high morbidity percentage along with abdominal breathing in affected pigs.

- **T-2 toxin, Vomitoxin**

Usually, we can't find a single symptom from T-2 toxin only. But we will find zearalenone and fumonisin symptoms including aflatoxin too. Though it is very difficult to diagnose, pattern of sickness, detail of feed formula, vaccination record and immunosuppression would be the probable guideline to identify the problem associated with T-2 toxin and vomitoxin toxicity. The symptoms are like porcine reproductive and respiratory syndrome (PRRS), Mycoplasma, Streptococcus, Glasser disease etc. In T-2 toxicity we normally find following symptoms in pigs-

Slow growth, rough coat, lean musculature, pale or yellow skin, indigestion and diarrhoea, reduced feed intake, in lactating sows there may be mastitis and low milk production, piglets will have low intake of colostrum. piglets get sick easily in the postnatal period specially in nursery and weaning period.

- **Zearalenone**

Zearalenone is estrogenic toxin which affects reproductive system of the sows. Swine still have normal feed intake except sows who receive zearalenone with trichothecenes have reduce feed intake. Usually, we can find zearalenone on soybean meal offered to animals. The swine receiving zearalenone will show different symptoms depending on level of toxin in feed as given below .

**During Gestation period:** Rough coat, scabies, repeat breeding, abortion, metritis, pyometra, long standing estrus (more than 5 days),

**Before the Farrowing period:** Low feed intake, mastitis

**Postnatal period:** Retained placenta, high piglet mortality, Crippled piglet, weak, un-uniformity, death before weaning, vaginal prolapse, metritis, pyometra, poor piglet weight at weaning, reduced feed intake (0.5-1 kg per pig per day)

**Sow after weaning** repeat breeding, infertility, pus flow in the estrus period

**Nursery period:** Reduce feed Intake, low weight gain, vaginitis, rough body coat, pale or yellow skin, rectal prolapse

**Fattening period:** Reduce feed Intake, coughing or sneezing, low weight gain and high FCR, vaginitis, mastitis, rectal prolapse

**Boar:** Reduce libido, poor salivation, poor semen quality and low sperm count, Low quality semen and sperm, atrophied testis

#### **Conclusion:**

Mycotoxicosis is universal and very complex problem found in animal husbandry. Utmost care in selection and screening of feed ingredients, proper storage and handling, good feed manufacturing practice, better farm hygiene along with good clinical view can help to reduce the incidence and subsequent losses in swine farming. In regular practice we do not go for testing analysis of mycotoxins in all feed ingredients. Identifying low level of a single mycotoxins we normally decide and formulate the mycotoxin control Programme. Though other mycotoxins are present in very minimum quantity, cumulatively several mycotoxins together create detrimental pathophysiological condition. Hence it is always better to go for 360-degree mycotoxin control Programme. It is very pertinent, even presence of low level several mycotoxins additively affect and can produce clinical symptoms and impacts on performance.

#### **When we are encountering mycotoxin problems in swine farm, we should consider and vigil below areas-**

- Should consider quality raw material rather considering low price only
- should not use a high level of one specific raw material in formula
- Should have a mycotoxin check program at every 2 week interval at different points of farm and feed mill equipment
- Identify high risk RM in the feed specially during high-risk period and can reduce the incidences
- Make high protein diet during the high-risk period and increase methionine content in diet to derisk the chances of toxicity
- Regular use good quality broad spectrum mycotoxin binder of reputed company specially during high-risk period
- During the period of mycotoxicosis to safeguard the animals from further diseases and infection

# Fixar®

## PRESERVATION

- **Fixar® S:** A blend of silicates specifically selected for high efficacy binding of a wide range of mycotoxins.
- **Fixar® Viva:** A blend of silicates and yeast cell wall components for increased efficacy in binding of a wide range of mycotoxins. Works at low inclusion levels.
- **Fixar® Bios:** The Multifunctional Broadpectrum Mycotoxin Binder For All Animal Feeds.



# Chairman's message

My thoughts are wide ranging, as I consider the message that I would like to share with you as we celebrate this holiday season and near the end of 2020.

The year 2020, will not easily be forgotten for most likely decades to come. I think of the global societal changes, the personal hardships, and in far too many cases the sad loss of loved ones experienced by so many on an unfathomable scale. Conversely, I am also reminded of the countless acts of heroism and kindness that have taken place around the world as a result of the Pandemic. Particularly, it is these acts that I prefer to remember when thinking back on the year 2020.



Organizationally speaking, I am thankful for YOU, our global Bentolians. This year has been neither normal or easy, and for all the Bentoli operations it has been filled with more challenges than in other years. However, considering all of the roadblocks and barriers that we faced. It was inspiring to see so many creative solutions and "out of the box" measures being implemented throughout the globe by you in order to help keep us on track. It is with this Bentolian spirit to push forward and succeed, that I wish for us to enter into the coming 2021 year.

Let us take the lessons learned this year, and use them to generate a flow of positivity toward collaborating "together" on greater Bentolian achievements.

Let us take a moment to say "thank you" to your Bentolian teammates that you work with either on a daily basis or every once in a while. Let them know that you appreciate them.

Let us turn our sometimes harsh words into words of encouragement to lift the spirits of others.

Let us welcome 2021, with a sense of gratitude for all the good things and blessings that we have been given.

Let us strive to simply do better, and be better. Let us BE THANKFUL!

**I wish you and your families a healthy and wonderful holiday season along with only the best that life has to offer in 2021!**

With regards,  
**William A. Robinson, Sr.**  
Chairman



For further information please visit  
our website at [www.bentoli.com](http://www.bentoli.com)

Visit us on    