ALQUERFEED BINMOLD

TECHNICAL FILE

PRESERVATIVE AND MYCOTOXIN BINDER IN POWDER PREMIX

COMPOSITION

Aluminium-calcium-sodium-proponic-formic synthetic sillicate 100% hydrated

TECHNICAL PROPERTIES

ALQUERFEED BINMOLD has a preservative and mycotoxin binding effect. It is used in birds and pigs to treat and prevent enteritis and intoxications (mycotoxicosis) caused by the ingestion of feed contaminated with mycotoxins and to preserve raw materials and compounded feeds.

DOSIS

ALQUERFEED BINMOLD is used mixed with feed at a dosis of 0.5 kg/ton.

INDICATIONS

Birds and pigs of all ages

WITHDRAWAL TIME

Not necessary.

STORAGE CONDITIONS

ALQUERFEED BINMOLD should be stored well-sealed in a cool, dry and dark place.

RECOMMENDATIONS FOR HANDLING

Prevent inhaling the powder and handle so as not to form powder clouds. Use apropriate machinery. Do not eat, drink or smoke while handling.

PACKAGING

Bags of 25 Kg.

SHELF LIFE

Two years after the date of manufacturing.

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FREQUENTLY ASKED QUESTIONS

PRESERVATIVE AND MYCOTOXIN BINDER

1. What is Alquerfeed Binmold?

ALQUERFEED BINMOLD is a product in premix powder format based on aluminium-sodium-calcium-formate-propionate sillicate hydrated 100%, designed to bind mycotoxins in cereals and feed and to preserve feed. It is destined for birds and pigs with the following properties:

- Prevents toxic effects of the mycotoxins in the animal.
- Protects the digestive mucus from lesions and irritations, while it promotes its regeneration.
- Detoxifies the liver.
- Prevents the appearance of diarrhoeas
- Improves feed digestion
- Works as a preservative of raw materials and compounded feeds
- Affects the preservation of the feed favourably
- It is harmless for the animal because it is not absorbed and also it is anticaking and ligand, especially in granulated feed.

2. What is the aluminium-sodium-calcium-formic-proponic sillicate?

Thealuminium-sodium-calcium-formate-propionatesillicate of **ALQUERFEED BINMOLD** is a molecule developed by Biovet S.A. and whose procedure of fabrication has been patented in Spain.

The molecule possesses a double mycotoxin binding and preservative effect thanks to its laminar tridimensional structure which gives the molecule a great capacity to absorb mycotoxins. The formate and propionate present in the structure act as preservative due to its capacity to deorganize the bacterial and fungal cells.

3. For which microorganisms is Alquerfeed Binmold active?

Basically for Gram-negative bacterias, yeasts and fungi, like *Salmonella spp., Staphylococcus aureus*, *Escherichia coli*, *Clostridium spp*., *Aspergillus spp., Penicillium spp*., *Fusarium spp.*

4. How does Alquerfeed Binmold work in the case of *Clostridium spp.*?

ALQUERFEED BINMOLD is active for *Clostridium* in feed but not in the interior of the intestine of the animal.

5. What are mycotoxins?

Mycotoxins are a group of substances produced by certain fungi in small quantities as secondary metobolites. Most of them have a high toxicity and carcinogenesis and upon ingestion by the animal they can be absorbed and passed to the blood circulation where they will produce a toxic set of symptoms or if they are not absorbed they will cause irritation of the digestive mucus.

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6. What are the most important mycotoxins and which fungus produce them?

This is shown in the following table:

Fungus producer	*Mycotoxins*
Some species of *Aspergillus*	Aflatoxin Ochratoxin
Some species of *Fusarium*	Fumonisine Trichotecenes Vomitoxin Zearalenone Deoxynivalenol
Some species of *Trichothecium*	Trichotecenes Nivalenol Deoxynivalenol T-2 toxin
Some species of *Penicillium*	Patulin Ochratoxin

7. What kind of pathologies do they provoke?

The most important syndroms are the following:

Syndrome	Specie
Haemorrhagic	Birds and pigs
Hepato kidney	Birds, pigs, rumiants
Genital or reproductive	Birds, pigs, rumiants
Nervous	Birds
Gastrointestinal	Birds, pigs, rumiants
Leucopénico	Birds
Subcutaneous	Birds and pigs
Decrease of the zootechnical performance	Birds, pigs, rumiants
Immune suppression	Birds, pigs, rumiants

The degree of toxicity depends on the animal specie, the age, weight, personal sensitivity, the dosis and the pattern of ingestion.

8. Is it posible to destroy or eliminate the mycotoxins?

There are different techniques: high temperatures, ultraviolet rays, acids and bases in high concentrations etc.but all of these are not feasible in practice.

9. How can we prevent the mycotoxicosis?

One alternative to the destruction of the mycotoxins is their absorption in chemical compounds that prevents the absorption of the mycotoxins in the intestinal tract.

The aluminium sillicates stand out as the best absorbers to use.

10. What is the mechanism of absorption of Alquerfeed Binmold ?

Sillicates are chemical compounds with a tridimensional structure capable of retaining the mycotoxins in their interior, preventing them from being absorbed in the intestinal tract. Upon contact with the mycotoxins the sillicates unite forming hydrogen bonds between the oxygen atoms of the sillicate and the hydroxyle terminals of the mycotoxins. The mycotoxins linked with the sillicates pass through the intestinal tract of the animals without causing irritations in the intestinal walls (enteritis) and without being absorbed (mycotoxicosis).

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ALQUERFEED BINMOLD consists of sillicates that work as a mycotoxin binder. The ions of calcium, aluminium and sodium are inserted in the sillicate structure, increasing its capacity to absorb mycotoxins as they assure that the distances between the oxygen molecules are optimal to form bonds with the hydrogen of the mycotoxins.

Also, thanks to its preservative activity, **ALQUERFEED BINMOLD** impides the growth of fungi that form mycotoxins.

11. What is the absorbing capacity of Alquerfeed Binmold?

For each type of mycotoxin, see the following table:

Mycotoxin	Binding efficacy (%)
Aflatoxin B1	99.90
Aflatoxin B2	99.90
Aflatoxin G1	99.90
Aflatoxin G2	99.90
Deoxynivalenol	98.90
Toxin T-2	99.90
Vomitoxin	98.90
Ochratoxin¡ A	98.90
Zearalenone	80.80
Oosporin	98.90

12. Does the absorbing capacity of Alquerfeed Binmold vary with the pH?

The absorbing capacity is stable for the different pH´s in the intestinal tracts, thus it has a range of pH 4 to 8.

13. Does the absorbing capacity of Alquerfeed Binmold vary with the temperature treatments to which the feed is subjected?

Its absorbing capacity does not vary with pellitization nor with extrusion.

14. What are the results that have been obtained with the use of Alquerfeed Binmold in feed contaminated with mycotoxins?

A. Use of Alquerfeed Binmold at different dosis in broilers (Panama).

Following a field trial conducted in Panama will be described in which the effect of the incorporation of increasing dosis of **ALQUERFEED BINMOLD** on feed contaminated with mycotoxins in broilers is analyzed.

Materials and methods:

Four groups of animals were analyzed, 1 control group and three group which were given increasing quantities of **BINMOLD**, 0.75, 1.5 Kg/Tm. At day 42 the animals were sacrified and the following parametres were analyzed:
Lesions on the soles of the feet, descapsulation of the femur, erosion of the intestine, erosion of the gizzard, relative weights: gizzard, intestine, liver and E.I (Efficacy Index).

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Results:

	CONTROL	0.75 Kg./Tm	1.5 Kg./Tm
Lesions of the soles of the feet	75%	50%	50%
Descapsulation of the femur	63%	12%	0%
Erosion of the intestine	2	1.75	0.75
Erosion of the gizzard	2	1	1
Relative weight gizzard	2.36%	3.06%	2.59%
Relative weight intestine	4.28%	4.72%	4.4%
Relative weight liver	2.47%	3.36%	2.85%
E.I.	251	261	265

Comments:

1. The lesions on the soles of the feet can have different causes. On one side, they can have been caused by a deficiency of Biotin, which originates from a lack of absorption of Biotin. On the other hand these lesions might have been caused by small accidental lesions. The mycotoxins present in the faeces imitate the existing lesions on the soles of the feet thus aggravating the problem. The ingestion of **BINMOLD** decreases the presence of lesions of the soles of the feet, although it does not solve the problem completely

2. The decapsulation of the femur is caused by a deficiency in absorption of the ions Ca/P on an intestinal level. This deficiency is caused by an erosive action of the mycotoxins on the mucus, therefore the administration of **BINMOLD** improves and even solves this problem.

3. As for the lesions caused by gizzard and intestine erosion, these were measured using a 0 to 3 scale, going from a total absence of erosion to a maximum erosion. Gizzard erosion is caused by the presence of fungus on a mucus level, although it could also have other causes. The treatment with **BINMOLD** improves this erosion but it does not disappear. Concerning the erosion of the intestine, this is caused by the direct action of the mycotoxins, producing a lack of absorption of ions and nutrients on intestinal level. **BINMOLD** improves these lesions and makes them disappear.

4. The relative weights of the intestine, gizzard and liver are indicators of the general condition of the digestive apparatus and the liver, but the obtained results show that they are not very good indicators of the absorbant action of **BINMOLD** as no direct relation between the obtained data and the administered dosis were shown.

5. The efficiency Index is calculated as following:

$$\text{E.I.} = {}^{\%\text{survivers x Klw}}/_{\text{days of breeding x F.C.}}\,(\text{feed conversión})$$

The results show that the E.I. improves notably as the levels of the administered dosis of BINMOLD were increased. This improvement means a decrease in feed costs during the same period of the study, caused by a lower Feed Conversion and an increase of the K.l.w. (Kg. of live weight) of the animals.

With this study the importance of **BINMOLD** as a booster of the sanitary and economic condition of those animals that have problems of mycotoxin presence in feed has been demonstrated.

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B. Use of Alquerfeed Binmold compared with a antifungal and commercial mycotoxin binder in broilers (El Salvador).

Materials y methods:
Five groups of animals were analyzed, of which each group was given a different antifungus and mycotoxin binder treatment.
T-1: antifungus 1 + mycotoxin binder 1
T-2: antifungus 2 + mycotoxin binder 2
T-3: antifungus 3 + mycotoxin binder 3
T-4: antifungus 4 + mycotoxin binder 4
T-5: **BINMOLD** (**dosis of 0.5 kg/Ton**)

At 36 days the animals were sacrificed and the following parametres were analyzed:

- % Mortality
- Feed consumption
- Weight in pounds
- Weight at slaughter
- F.C. (Feed Conversion)
- E.I. (Efficiency Index)

Results:

T	I.B.	A.M	% M	E.B.	C (QQ)	WEIGHT (POUNDS)	SLAUGHTER WEIGHT	F.C.	DAYS TO SLAUGHTER
T-1	200	9	4,5	180	13,21	4,35	763,9	1,69	36
T-2	204	10	4,9	178	13,47	4,32	769,8	1,75	36
T-3	208	15	7,2	189	14,21	4,35	822,1	1,73	36
T-4	207	11	5,3	189	14,15	4,28	809,2	1,75	36
T-5	195	9	4,6	175	13,61	7,46	760,3	1,74	36
TOTALS	1,014	54	5,32	911	88,65	4,352	3,955,10	1,73	36

T: treatment; I.B.: initial amount of birds; A.M.: accumulated mortality; % M : % of mortality; E.B.: amount of birds at end of trial; C: consumption; F.C: Feed conversion

Comments:

With the use of **BINMOLD** a lower mortality is obtained unlike in the rest of the treatments with two different products. The feed consumption corresponds to 13.61 QQ(Cubic Quintal), which corresponds to the lowest consumption after T-1 and T-2. With this amount of feed ingested the broilers reached a higher weight (in pounds) of 7.46, with the F.C. at 1.74 one point lower than that of T-3.

C. Efficacy of ALQUERFEED BINMOLD in mycotoxicosis in pigs (Spain)

Trial conducted on experimental farm in Spain with pigs of Iberic race, administrating **ALQUERFEED BINMOLD** at a dosis of 0.5 kg/Tm mixed with the feed contaminated with mycotoxins for 45 days.

	Average daily weight gain (ADWG)
Control feed	662 g
Feed + **ALQUERFEED BINMOLD**	730 g
Feed + Deoxinivalenol (0-1 ppm) y Zearalenona (5 ppm)	512 g
Feed + Deoxinivalenol (0-1 ppm) y Zearalenona (5 ppm) + **ALQUERFEED BINMOLD**	612 g
	ADWG on day 45 of the trial
Control feed	0.60 kg/day
Feed + 800 ppb of Aflatoxins	0.41 kg/day
Feed + 800 ppb of Aflatoxins + **ALQUERFEED BINMOLD**	0.65 kg/day

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15. Does Alquerfeed Binmold also absorb the vitamins and aminoacids in the diet?

According to different studies conducted moslty in broilers, the administration of **ALQUERFEED BINMOLD** does not interfere with the absorption of the essential nutrients that the feed contributes (vitamins, minerals, aminoacids) nor does it interfere with medicine.

16. What advantages does Alquerfeed Binmold have in comparison with other hydrated sodium aluminium calcium sillicates (HSCAS) and preservatives?

ALQUERFEED BINMOLD is a specialty based on a complex molecule with excellent preservative and mycotoxin binding properties.

Its high efficacy leads to a lower dosis of the product in the feed (0.5 kg/ton) in comparison with other products of the same composition. This ultimately saves costs of maintaining efficacy. Also, a mycotoxin action and preservative action are achieved in the same products.

17. What other advantages does Alquerfeed Binmold have?

- It is a harmless product.
- It can be used in all species and ages.
- It is a molecule whose synthesis has been developed by Biovet S.A.

18. What is the recommended dosis of Alquerfeed Binmold?

The recommended dosis is 0.5 kg/ton, which is considerably lower than other products of similar composition.

19. Who should I contact for technical questions?

Your distributor or our technical department, telephone +34 977296304 or e-mail comercialinternational@biovet-alquermes.com