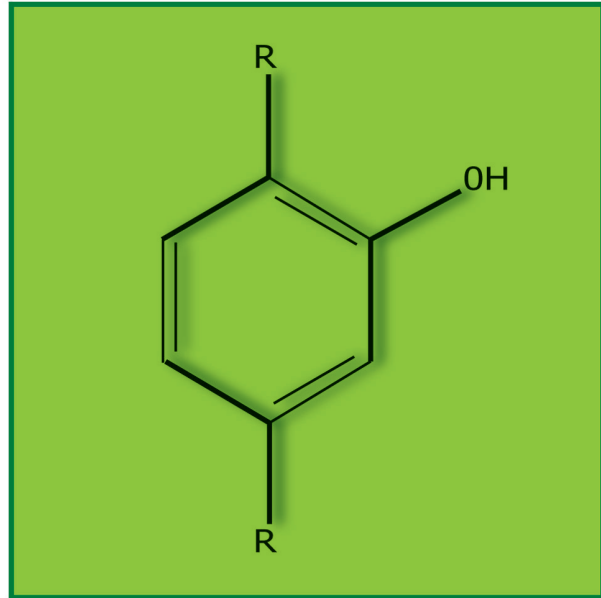
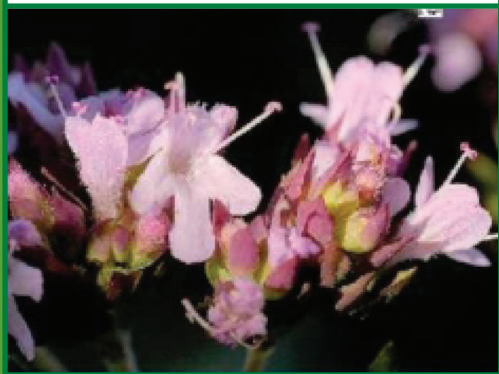


ALQUERMOLD NATURAL



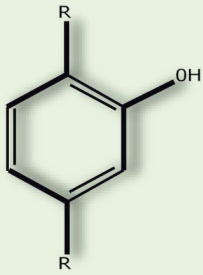
**ANTIMOLD, ANTIMICROBIAL AND
ANTIOXIDANT ADDITIVE BASED ON
PLANT EXTRACTS**

- Acts as feed preservative
- Controls intestinal flora
- Has antioxidant properties



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CIMENOL RING

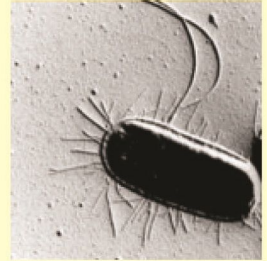
CIMENOL RING is a chemical structure common to many molecules with preservative properties found in plant extracts that have been traditionally used as preservatives.

Cimenol Ring is found in plant extracts of *Thymus vulgaris*, *Origanum majorana*, *Origanum vulgare*, *Mentha piperita*, *Ocimum basilicum*, *Salvia officinalis*, *Citrus limon*.

Bactericide and Fungicide

MECHANISM OF ACTION

Bacteria: Contact with the cimenol ring causes in bacteria the immediate release of cell contents to the medium. It is due to perforation of bacterial membrane that leads to destruction of the cell.



Yeast and Fungi: In addition to perforation of cell walls, cimenol ring inhibits ergosterol biosynthesis, which is the most important sterol in yeast's cellular membrane, contributing to the destruction of the cell.

Antioxidant Activity

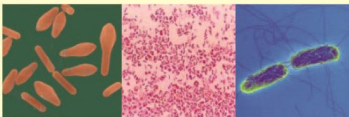
It prevents lipid oxidation and maintains feed organoleptic and nutritional properties.

MECHANISM OF ACTION

- Cimenol ring spares nutrients in the process of peroxidation as it is more reactive in the presence of free radicals.
- Anti-free radical capacity of cimenol ring is similar to that of BHT.



Control of Intestinal Flora



Due to its effective bactericide and fungicide activity, cimenol ring controls intestinal pathogenic flora, like, *Salmonella*, *E. coli*, *Clostridium sp.* or *Staphylococcus sp.*

SYNERGY WITH WEAK ACIDS (CITRIC ACID)

Mechanisms of action of cimenol ring and citric acid are complementary, because:

First Step: cimenol ring breaks the cell wall and facilitates penetration of weak acids

Second Step: weak acids interfere with cellular metabolism



Micro-organism Death

ALQUERMOLD NATURAL is based in the synergy cimenol ring and citric acid.

Efficacy Test 1

Polytechnic University of Valencia, 1999
The purpose of the trial is to demonstrate the immediate effectiveness of **Alquermold Natural** as a fungicide and bactericide

Alquermold Natural is added to bacterial and fungal cultures at different concentrations and growth inhibition is observed.

	0 ppm A. Natural P.	100 ppm A. Natural P.	200 ppm A. Natural P.	400 ppm A. Natural P.	800 ppm A. Natural P.
Salmonella	++	++	+	-	-
Staphylococcus aureus	+++	+++	++	-	-
Escherichia coli	+++	+++	++	-	-
Aspergillus flavus	+++	+++	++	-	-
Fusarium	+++	+++	++	-	-
Penicillium	+++	+++	++	-	-
Candida albicans	+++	+++	++	-	-

+++ a lot of growth
++ growth

+ little growth
- no growth

Growth is clearly inhibited at a concentration of 400 ppm.

Efficacy Test 2

1. Results with Fusarium tricinctum

Cimenol concentration (ppm)	Total inhibition of growth	Colonies size	Sporulation
0	NO	5,6 - 6	YES
100	NO	3,5 - 4	NO
200	NO	1,5 - 2	NO
400	YES	-	-
800	YES	-	-

2. Results with Aspergillus flavus

Cimenol concentration (ppm)	Total inhibition of growth	Colonies size	Sporulation
0	NO	3,8 - 4	YES
100	NO	0,8 - 1	NO
200	YES	-	-
400	YES	-	-
800	YES	-	-

Inhibition of toxin production

IMC

Synergism with Citric Acid Test 1

Biovet's R+D Department in collaboration with University Rovira i Virgili, 2008
A combination of cimenol: citric acid (3:1) is added to cultures of *Fusarium* at different concentrations.

Cimenol concentration (ppm)	Total inhibition of growth	Colonies size	Sporulation
0	NO	5.6 - 6	YES
100	NO	3.5 - 4	NO
200	NO	1.5 - 2	NO
400	YES	-	-
800	YES	-	-

Cimenol: citric acid concentration (ppm)	Total inhibition of growth	Colonies size	Sporulation
0	NO	5 - 5,5	YES
100	NO	3.5 - 4	NO
200	YES	-	NO
400	YES	-	-
800	YES	-	-

Conclusion: With citric acid results are better.

Long Term Efficacy Test 1

Polytechnic University of Valencia, 1999
The purpose of the trial is to demonstrate the effectiveness of **Alquermold Natural** as a fungicide and bactericide in long-term stored feed.

The trial has been conducted using commercial feeds artificially contaminated with *Aspergillus flavus*, *Penicillium* and *Fusarium* and kept at 28°C for 40 days. Periodic counts of the nº of spores per gram of feed were done. The dose of **Alquermold Natural** used is 0.4 kg/ton.

	0 days	7 days	14 days	21 days	40 days
Without preservative	10200	18000	22000	25000	16000
Alquermold Natural P	10200	390	320	320	215

Spore count *Aspergillus flavus* per gram of feed (colony forming units/gram)

	0 days	7 days	14 days	21 days	40 days
Without preservative	42000	60000	76000	82000	69000
Alquermold Natural P	42000	4700	1500	250	160

Spore count *Penicillium* per gram of feed (colony forming units/gram)

	0 days	7 days	14 days	21 days	40 days
Without preservative	1600	550	220	60	5
Alquermold Natural P	1600	0	0	0	0

Spore count *Fusarium* per gram of feed (colony forming units/gram)

Long Term Efficacy Test 2

Batch	Day 0	Day 7	Day 14	Day 21	Day 42
Control	8 x10 ⁵	8.5 x10 ⁵	2.35 x10 ⁶	5 x10 ⁵	8 x10 ⁵
Cimenol	8 x10 ⁵	8 x10 ³	1 x10 ¹	0	0
Batch	Day49	Day63	Day 70	Day 84	Day 98
Control	2.06 x10 ⁶	2.08 x10 ⁵	4.3 x10 ⁶	3.7 x10 ⁶	6.5 x10 ⁶
Cimenol	0	0	0	0	0
Batch	Day126	Day140	Day154	Day 168	Day 182
Control	4.6 x10 ⁶	2.1 x10 ⁶	2.7 x10 ⁶	2.1 x10 ⁶	2.5 x10 ⁶
Cimenol	0	0	0	0	0

Results show the fungicide effect of Cimenol ring at 400 ppm with 100% efficacy at the third week.

ALQUERMOLD NATURAL
maintains its effectiveness over time

In Vitro Test

Results in pig and poultry feed

		Pig	Poultry
Cultive	Control/Test	Average cfu/g	Average cfu/g
Fungal Count	Control	21.000	2.200
	Organic Acids	7.300	1.500
	AMN	1.000	0
Yeast Count	Control	2.000	250
	Organic Acids	200	400
	AMN	0	0

ALQUERMOLD NATURAL

COMPOSITION:

Cimenol ring	300 mg
Citric acid (E-330)	100 mg
Excipient	1 g

TARGET SPECIES AND INDICATIONS:

- Bacteria (*Salmonella*, *E.coli* y *Clostridium*), Fungicide (*Penicillium*, *Aspergillus* y *Fusarium*) and natural preservative.
- Intended to protect poultry and livestock feeds from fungal and bacterial contamination as well as chemical oxidation.

INCLUSION RATE:

- 400 grams to 1kg per ton of finished feeds

STORAGE:

- Store tightly closed in a dry, fresh and well-ventilated place.

PACKAGING:

- 25 kg per bag

MANUFACTURED BY:

- Biovet, S.A. - Luxemborg, 25 Poligono Industrial 43120 Constanti (Tarragona) Spain

Exclusively distributed by:



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ALQUERNAT NEBSUI

Biovet S.A has developed Alquernat line based on pronutrients (from botanical origin).

Plants and animals coexistence has always been important for their development and animals diets include plant components in small quantities but with significant benefits.

Pronutrients are bioactive molecules from plants that, when incorporated in feed, can improve animal physiology by increasing gene expression.

This process can work directly or indirectly and, usually, nutrients do so by acting as ligands for transcriptional factors' activation that will then stimulate receptors synthesis.

An external stimulus, like a nutrient, reaches a specific biochemical receptor of the organism , which activates or deactivates a trigger responsible for the DNA replication and the generation of an active protein.

Pronutrients are classified into ten categories, according to their activity area: intestinal mucosa conditioners, gut mucosa optimizers, liver protectors, immune boosters, feed optimizing pronutrients, anti free-radicals, epithelia conditioners, pituitary conditioners, prebiotics and mineral metabolism conditioners.



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CREATING HEALTH AND
IMPROVING EFFICIENCY**

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ALQUERNAT NEBSUI®

PATENTED

INTESTINAL WELFARE

PRONUTRIENTS



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ALQUERNAT NEBSUI



Alquernat Nebsui is a natural product based on plant extracts with a high content of pronutrients.

It maintains the physiological condition of the digestive tract by stimulating the regeneration of the epithelium: villi's height and crypts' depth increase, which leads to a better nutrient absorption and avoids the fixation of pathogenic bacteria to enterocytes.

It also helps preventing the MMA syndrome (mastitis-metritis-agalaxia).

MECHANISM OF ACTION

Pronutrients present in Alquernat Nebsui are conditioners of the intestinal mucosa, which means they:

- ⇒ Increase intestinal mucosa renovation
- ⇒ Improve digestion and nutrients absorption
- ⇒ Allow greater control of pathogenic microorganisms in the intestine

ADVANTAGES



Alquernat Nebsui is an effective alternative to antibiotic growth promoters because it achieves:

BETTER FEED CONVERSION RATE
LESS % OF DIARRHEA
LESS MORTALITY

...with the following advantages:

It does not alter the intestinal flora.

It does not generate residues.

It does not require suppression time.

RECOMMENDED DOSE

It must be administered mixed with feed at 0.5 kg/t of feed, during all the animal's life.

SPECIES AND AGES

All animal species of all ages and productive stages.



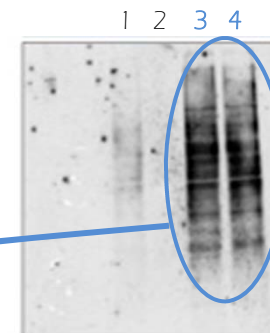
IN VITRO ASSAY



Target:: Determination of Alquernat Nebsui's capacity to induce the activity of porcine intestinal cells. Comparison with a control and a protein synthesis inhibitor.

Results: A darker mark means higher cellular activity.

1. Control group
2. Inhibitor of protein synthesis.
3. A. Nebsui ($1/10^3$)
4. A. Nebsui ($1/10^4$)



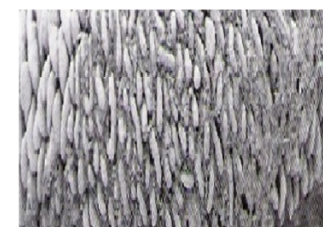
RNA-protein translation rate

Production of specific protein

Activity of the intestinal cells

ALQUERNAT NEBSUI enhances intestinal regeneration and functionality

Intestinal mucose (microscopy)



WITHOUT A. NEBSUI



WITH A. NEBSUI