



A 2-in-1 drinking water concept for generating higher bird performance

- A unique methionine value for enhanced stress recovery
- Contributes to the control & prevention of bacterial GIT disorders

One of today’s continuous challenges in modern poultry production is sustaining an optimal bird performance under various stress conditions such as gut health disorders. Supplementing the drinking water with a targeted solution, combining a nutritional value with a pathogen control of the water supply and upper digestive tract of birds can be an effective way to support high production productivity.

ACTIVATE® WD MAX

- A unique, high concentrated 2-in-1 blend of a liquid source of methionine (ALIMET® feed supplement) combined with other free organic acids
- Supports animals to recover from stressful situations such as infectious diseases, heat, feed withdrawals or transportation and contributes in preventing bacterial digestive tract disorders
- Low inclusion rate required in the drinking water of poultry

Novus recommended program

Preventive use

- to maintain bird performance during heat stress or prevent enteric disorders
 - 0.5 -1 ml/L drinking water,
 - Broilers: from day 7 until slaughter
 - Layers: from day 7 up till end of lay

Curative use

- In case of enteritis challenges, wet litter problems
 - 2ml/L drinking water during 2-3 consecutive days, followed by 0.5ml/L during the next 10 days or up till slaughter if necessary

Remarks - inclusion rates can vary depending on the hardness & pH status of the drinking water at the farm
 - water pipelines, tanks and drinking systems should be effectively monitored & cleaned to ensure optimal efficacy of an ACTIVATE WD MAX application

Available in 10kg, 30kg pails and 1000kg IBC

A 2-in-1 drinking water concept

1/ ACTIVATE WD MAX, supports birds under stressed conditions

ACTIVATE WD MAX contains 35% HMTBa*, a unique source of methionine
Under stress conditions, HMTBa aids in ensuring an optimal bird performance through:

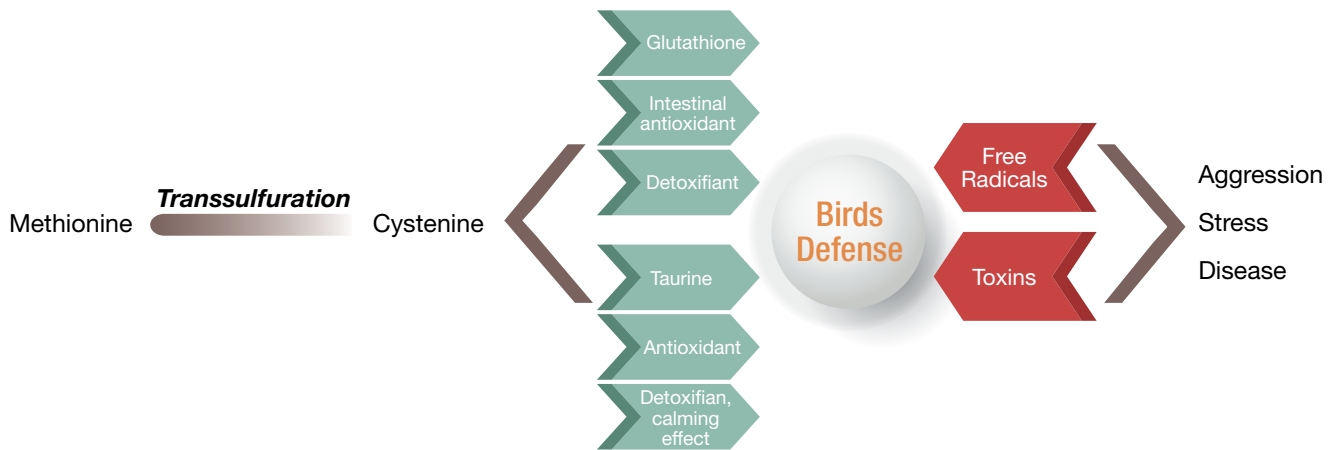
Sustained feed efficiency

- Maximum absorption of HMTBa in birds exposed to heat stress thus assuring optimal availability of methionine for growth and development¹.
- Maintained feed intake².

Feed consumption during heat stress can drop strongly and is directly correlated with the plasma level of methionine. High concentrations can inhibit the appetite, even when methionine is supplemented at recommended levels³. With ALIMET, low levels of methionine in the plasma can be found.

*2-hydroxy-4 methylthiobutanoic acid

Support physiological defence mechanisms

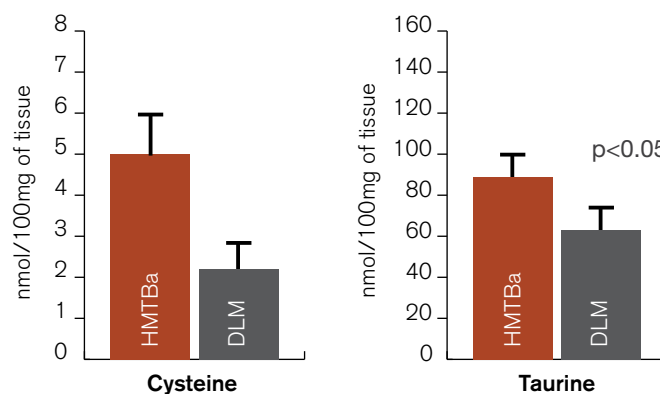


Upon absorption, HMTBa is metabolized into cysteine (through transulphuration), a key amino acid for organism defense. It is a precursor of taurine and major component of glutathione and other diverse defense proteins (Fig.1).

Thus more cystein becomes available for the bird, resulting in:

- Increased resistance to oxidative stress
- Strengthened detoxification processes
- Enhanced overall defense mechanism

Figure 1. Significant increase of cysteine and taurine concentration in intestinal cells obtained with HMTBa⁴



Cysteine and taurine serosal concentrations in everted sacs from the duodenum after 30 min. of incubation with 7mmol/l HMTBa or L-methionine

A 2-in-1 drinking water concept

2/ ACTIVATE WD MAX, contributes in preventing enteric disorders

ACTIVATE WD MAX contains a total of **89% organic acids** including formic & propionic acid.

⇒ reinforces dose-dependently the stomach bacterial barrier

⇒ its active ingredients act synergistically to support the health of the upper intestinal tract

- HMTBa is a strong organic acid (short-chain monocarboxylic) with the same molecular structure as formic and propionic acid (Fig. 2).

⇒ HMTBa acts primarily in the proximal digestive tract, in a low pH environment (Fig.3)

- Formic acid acts bactericidal on *E.coli* in low pH conditions (MRP 2000)

- HMTBa acts synergistically with formic acid against *Salmonella* and *E.coli*



Figure 2. Molecular structures of HMTBa, formic and propionic acid.

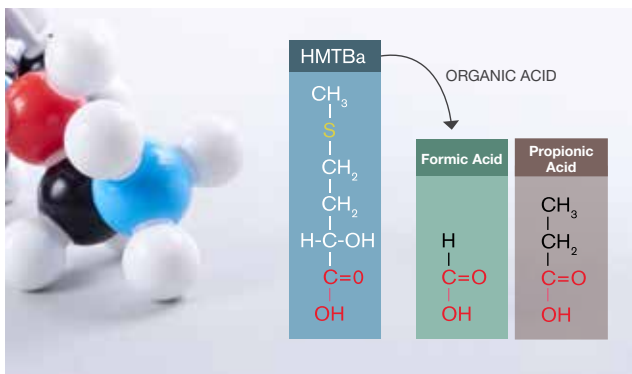
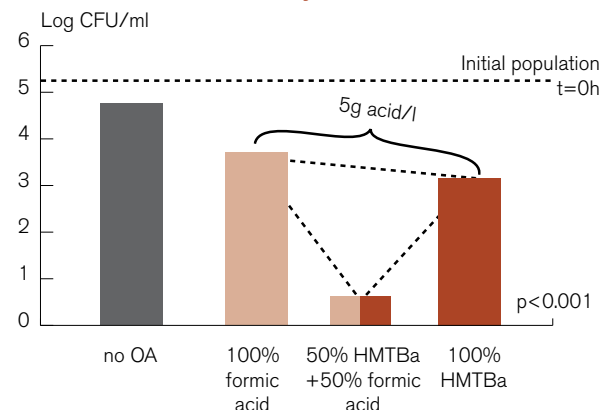
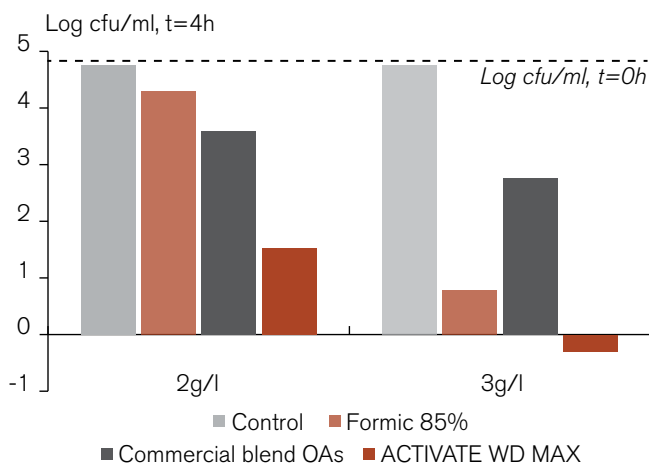


Figure 3. HMTBa combined with formic acid superiorly reduces growth of *S. enteritidis* compared to formic or HMTBa only⁵.



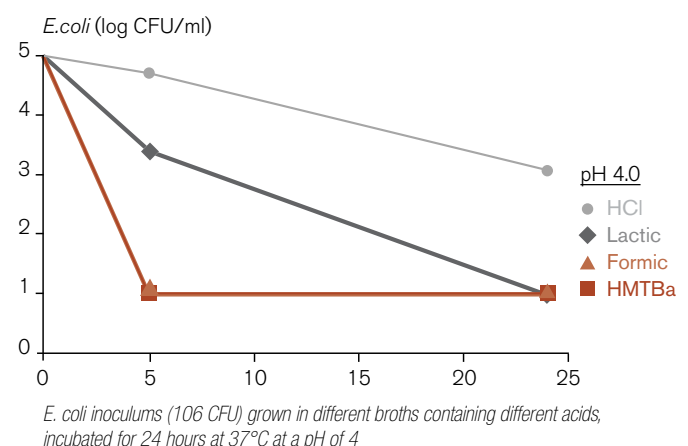
Reduction of *S. enteritidis* after 4 hours incubation at 37°C and a pH of 4.5 In vitro stomach model

Figure 4. ACTIVATE® WD MAX superiorly reduces growth of *Salmonella enteritidis* compared to competition⁶.



Reduction of *S. enteritidis* after 4 hours incubation at 37°C and a pH of 4.5 In vitro stomach model

Figure 5. At a pH of 4, HMTBa shows similar antimicrobial activity against *E.coli* as formic acid as seen in a clear degree of bacteriostasis⁷.



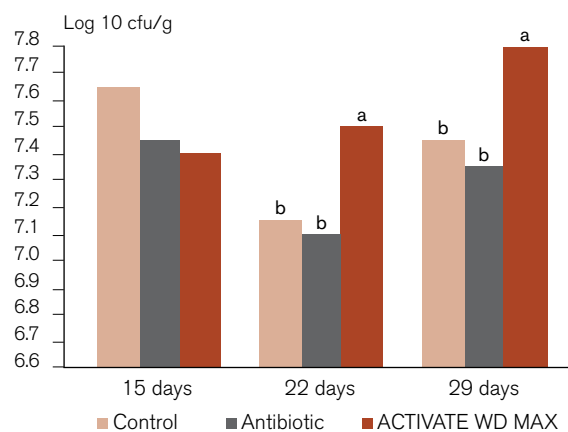
E. coli inoculums (106 CFU) grown in different broths containing different acids, incubated for 24 hours at 37°C at a pH of 4

- **ACTIVATE WD MAX lowers the pH of the drinking water to 3-4 to exhibit an optimal antibacterial, sanitizing effect.**
- **ACTIVATE WD MAX supports a healthy balance of the intestinal microflora and significantly reduces the opportunities for colonization by pathogenic species.**

Enhanced growth of the positive flora in the lower gut

An increase in lactobacilli in the GIT has been reported to reduce caecal colonization of Salmonella (Zhang et al, 2007). By stabilizing the intestinal bacterial population, use of ACTIVATE WD MAX in water results in a reduction in horizontal transmission of salmonella in poultry flocks (Knight et al, 2006).

Figure 6. ACTIVATE WD MAX significantly increases lactobacilli numbers in the ileum compared to non-supplemented birds or birds receiving antibiotics in feed (BMD®)⁸.



Significant reduction of Salmonella spreading to non-infected birds

Figure 7. Birds receiving 0.4ml/L ACTIVATE WD MAX show a significant decrease (1.5 log) of Salmonella in the caecal contents at d 49.⁹

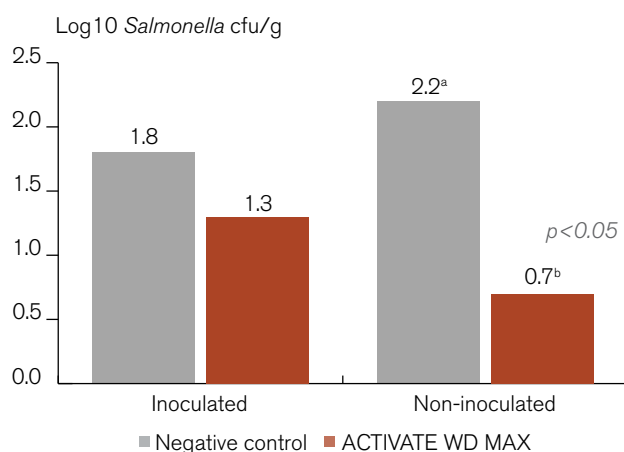
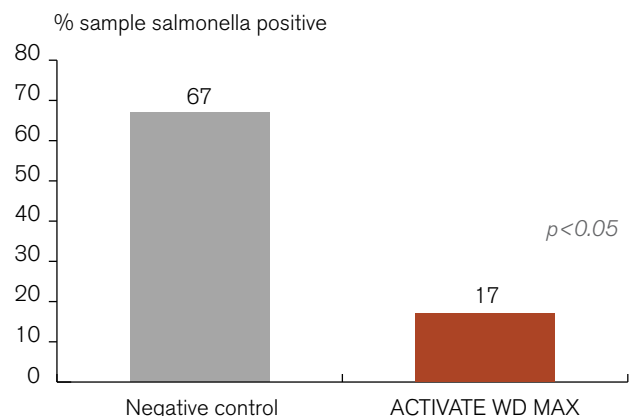


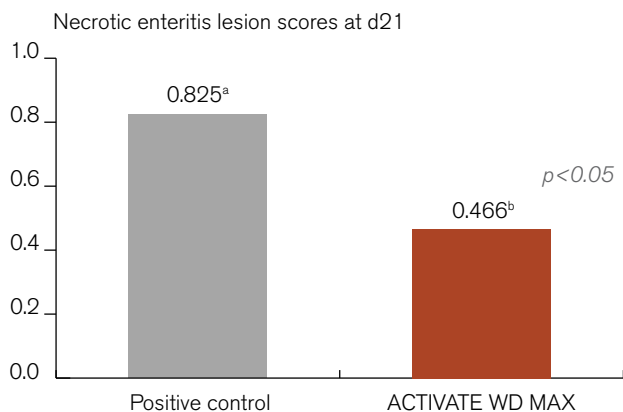
Figure 8. Significant fewer Salmonella positive litter drag swabs of pens containing birds supplemented with ACTIVATE WD MAX in the water.¹⁰



Improves broiler performance when challenged with *Clostridium perfringens*

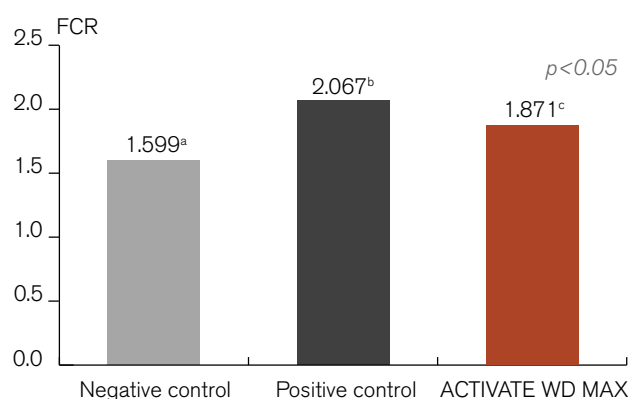
The treatment of broilers with ACTIVATE WD MAX through the drinking water reduced the impact of a coccidia/clostridium challenge and thus resulted in an improved feed efficiency¹⁰.

Figure 9. Less NE lesion scores in the gut of broilers, challenged with coccidia spp. and *C. perfringens*, after supplying ACTIVATE WD MAX



Negative control: non-challenged, non-treated birds.
Positive control: challenged, non-treated birds.

Figure 10. Improved (adjusted) feed conversion ratio at d28



1. Dibner et al. 1992 "Metabolic Differences Between 2-Hydroxy-4-(Methylthio) Butanoic Acid (HMB, Alimet) and D,L-Methionine (DLM) During Heat Stress." presented at the Southern Poultry Science Meetings in Atlanta
2. Knight et al. 2007 "Relative Bioavailability of HMTBa and DLM: Resolution of the Bioefficacy Controversy."
3. Harper, 1970; Edmonds and Baker, 1987, Picard et al 1993, Vazquez-Anon et al. 2003; Gonzalez Esquerra et al. 2007
4. Martin-Venegas et al., "Conversion of the Methionine Hydroxy Analogue DL-2-Hydroxy- (4-Methylthio) Butanoic Acid to Sulfur-Containing Amino Acids in the Chicken Small Intestine", Poultry Science 2006
5. Enthoven et al. "Salmonella inhibiting activity of 2-hydroxy-4-(methylthio)butyric acid (HMTBa, Alimet®), CCL Research, The Netherlands, 2003
6. CCL 2004, "The effect of Activate WD™ vs other OA on Salmonella enteritidis *Other commercial blend of OA: contains 1/3 formic acid
7. Dibner et al. 2002
8. Nava, 2009. "Molecular analysis of microbial community structure in the chicken ileum following organic acid supplementation."
9. Hofacre et al. "Organic acid water treatment reduced Salmonella horizontal transmission in broiler chickens." XII European Poultry Conference, Verona, Italy, 2006
10. Quiroz 2005. "Effects of ACTIVATE™WD on Clostridium perfringens colonization and broiler performance using a necrotic enteritis model in broiler chicken."

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