

# Altech<sup>®</sup> MYCOTOXIN MANAGEMENT

## Mycotoxin Impact on Beef Cattle



Family	Mycotoxins	Contamination	Mode of action (MOA)	Symptoms in beef cattle
Aspergillus	Aflatoxin (B1, B2, G1, G2)	Corn, corn-by products, cottonseed, peanuts, etc.	Aflatoxins are carcinogenic and mutagenic, act as a DNA intercalating agent leading to cell death or transformation into a tumor, inhibit T-lymphocyte functions and affect blood leukocytes.	Reduced feed intake, reduced milk production and weight gain, liver lesions with congestion and bleeding, fatty liver, reduced fertility, hemorrhages (intestinal tract, kidneys); immune suppression; Aflatoxin M <sub>1</sub> residue in milk (transfer of 1,7% to 6% of dietary Aflatoxin B <sub>1</sub> to Aflatoxin M <sub>1</sub> in milk).
	Ochratoxin A	Small grains such as wheat, barley, silages	Ochratoxin A has been shown to affect ruminants, however in a well functioning rumen, it is rapidly degraded. Greater adsorption of Ochratoxin A is observed in case of rumen acidosis when rumen pH and protozoa population decrease.	Kidney damage, increased water intake, pulmonary oedema, increased mortality at high inclusion levels, increased disease incidences.
Fusarium	Fumonisin (B1, B2, B3)	Corn, corn-by products, forages	Poorly metabolizes in the rumen, target organs in the ruminant are liver and kidney, affect sphingolipid synthesis.	Reduce feed intake and weight gain; immune suppression; poor gut health, increase in sphiganine/sphingosine ratio.
	Fusaric acid	Corn, corn-by products	Reduces blood pressure.	Swollen legs and hocks.
	Type A Trichothecenes (T-2 toxin, HT-2 toxin, diacetoxyscirpenolinter)	Typical field mycotoxins, produced on crops, corn, wheat, barley	Partially metabolized in the rumen, rumen adsorption may be increased by rumen acidosis when cellulolytic bacteria activity decreases, reduced protein synthesis.	Reduced feed intake, reduced weight wain, reduced milk production, digestive disorders (vomiting and diarrhea); acute hemorrhagic enteritis, reproductive failure, increased mortality, hemorrhages (stomach, heart, intestine, lung, bladder, kidney); edema; dermatitis; immune suppression, abomasal and ruminal ulcers, and death, serum immunoglobulins and complement proteins were lowered in calves receiving T-2 toxin and reduction in white blood cell and neutrophil counts in calves.
	Type B Trichothecenes (Nivalenol, deoxynivalenol, fusarenon-X)	Corn, wheat, barley, DDGS, soybean meal, forages	DON is rapidly converted to deoxynivalenol-diepoxid (DON-1) by rumen microorganism, but cows with acidosis and microorganism imbalance may lead to incomplete DON rumen detoxification, decreased protein synthesis, damage to gut villi, affect neurotransmitter concentrations.	Decrease in DMI, digestive disorders (vomiting, diarrhea, feed refusal); reduced weight gain and milk production; poor immunity, especially increased somatic cell counts. Decrease in dietary fiber digestion and acetate: propionate ratio. DON may also reduce phagocytic and neutriphilic activity and consequently determine serious symptoms when mastitis and lameness occurs.
	Zearalenone	Naturally contaminated creerals or in forages. Concentrations increase in storage	Estrogenic compound, interact with receptors on reproductive organs, partially metabolized to $\alpha$ -zearalenol and $\beta$ -zearalenol in the rumen, $\alpha$ -zearalenol is four times more estrogenic, rumen transformation does not lead to detoxification.	Irregular estrus cycles; abortions, embyronic mortality, atrophy of testicles and ovaries; enlargement of mammary gland, in particular in virgoiin heifers, vaginitis, prolactin hormone release and occurence of follicular cysts in cows.

# Alltech<sup>®</sup> MYCOTOXIN MANAGEMENT

## Mycotoxin Impact on Beef Cattle



Family	Mycotoxins	Contamination	Mode of action (MOA)	Symptoms in beef cattle
Penicilium	Roquefortine C	Silage and stored commodities	Roquefortine C is potentially a neurotoxic compound.	Neurotoxic; compromised rumen function.
	PR toxin	Silage and stored commodities	Increased capillary permeability resulting in direct damage to the lungs, heart, liver and kidneys.	Neurotoxic and hepatotoxic; abortion and retained placenta.
	Patulin	Occur typically in whole fruits, cereals, silages, processed products and by-products	Possesses broad-spectrum antibiotic properties, genotoxic, i.e. causes damage to the DNA or chromosomes which can cause mutations or tumors.	Compromised rumen function, irritant, hemorrhaging in the digestive tract, neurotoxic; immune suppression.
	Verruculogen	Silage and stored commodities	Reduces concentrations of gamma aminobutyric acid, an inhibitory neurotransmitter, in the brain.	Tremorgenic effect.
	Mycophenolic acid	Silage and stored commodities	Inhibits an enzyme needed for the growth of T cells and B cells.	Immunosuppressant.
Claviceps/ Acremonium	Tall fescue toxins (Ergotamine, ergot alkaloids)	Wheat, barley, sorghum, rye and tall fescue	Ergot acts as an agonistic molecule on dopamine receptors, ergotamine show changes in isovalerate, propionate and ammonia nitrogen rumen concentrations, ergot works as a dopaminergic alkaloid deleting LH secretion and plasmatic prolactin.	Significant effected on rumen function, decreasing dry matter intake and milk production, nervous or gangrenous syndromes; ryegrass staggers (abnormal behavious, general weakness, convulsions), high temperature intolerance in summer with hyperthermia, lipid tissue necrosis and foot injury also known as "fescue foot", decrease in reproductive performance of cows, interference with ovulation, luteal function and pregnancy maintenance, reduced pregnancy rate (PR) abd increased embryo mortality.

For more information, please visit [knowmycotoxins.com](http://knowmycotoxins.com) or contact your local Alltech representative today.

*Your cattle are your business.  
Protecting them is ours.*

