

# GUT HEALTH IN RUMINANTS

## The key to unlocking profitability

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The gastrointestinal tract, also called the GIT or simply referred to as the gut, plays a massively important role in ruminant production. The 3 main pillars supporting any profitable production animal enterprise are Production, Reproduction and Immunity. These aspects will be touched upon individually, but these 3 pillars stand on a foundation of optimal gut health, as the well-being of the ruminant gastrointestinal tract can directly affect these 3 pillars.

### Production

The whole point of a production animal business is that we take feed, bought or produced at a specific cost, and we add value to it by feeding it to our animals in order to sell a more expensive product (animal protein or meat) at the end of the feeding cycle. An analogy can be drawn with mining gold – the iron ore is extracted from the ground, processed and eventually turned into valuable gold products. If our animals do not grow (produce) optimally, we are losing out on profits at the end of the production cycle. Many factors affect production, from genetics to nutrition, through to disease and parasite management, to name but a few factors.

### Reproduction

Any sustainable production animal enterprise should be growing or at least self-sustaining from an animal point of view. Cows need to produce a calf every year, sheep are expected to produce at least twins yearly at the bare minimum, often 3 times in 2 years. Not only must our animals give birth, but they must raise and wean their offspring successfully. Genetics are expected to improve with each successive generation, requiring a good understanding of genetics and breeding. Successfully reared young animals are then able to enter the production system discussed above (a typical cow-calf or sheep ranching operation) or become part of the reproductive system that subsequently produces offspring as well. Factors affecting fertility, reproduction and subsequent rearing are many and often complex, but include many of the same factors listed in the paragraph above.

### Immunity

It stands to reason that animals that are unhealthy or sick are unlikely to produce or reproduce as successfully as their non-affected herd mates. A strong immune system enables the animal to withstand disease challenge and produce or reproduce optimally, assuming all other management is adequate. Production and reproduction aside, we run the risk of animals dying if the disease or pathology is severe enough, a loss of all the input costs put into that animal as well as future earnings from that animal. Factors influencing immunity or disease status are also many, but commonly include disease challenges that are geographical or seasonal, vector-borne or infectious, vaccination and vaccine management, trace mineral status, vector management (carriers of disease such as ticks, flies, midges, etc.), genetic predispositions and more.

### So what role does the gut play?

If one considers that the inside of the gastrointestinal tract is theoretically outside the body (imagine the gut as a pipe from the mouth to the anus), it can then be safely said that the lining or the wall of the gut is the first line of defence against pathogens and harmful substances from the environment in which the animal lives. The gut is then also the organ primarily responsible for the intake and effective absorption of the nutrients that an animal needs to survive, grow, reproduce and remain healthy.

A gastrointestinal tract that is damaged by any agent, living or inanimate, will not be able to absorb nutrients optimally, at least not as well as herd

mates not suffering from the same gut pathology. Start to think about Average Daily Gain (ADG - the amount of weight that an animal puts on every day) and Feed Conversion Ratio (FCR - the ration of feed consumed to weight gained) – do you remember the earlier statement about adding value to the feed we put into our animals? An animal that is not effectively and optimally converting this feed into growth or reproduction is not contributing to your bottom line and may well be costing you money instead.

A damaged gut is also more likely to allow pathogens such as bacteria and viruses to gain entry into the body, making animals sick and possibly even resulting in death. Intestinal worms, protozoa, bacteria, viruses, toxic plants and even feed can damage the wall of the gut, leading to compromised integrity and ill-health, with all the knock-on effects described above.

We need to invest in the health of the gastrointestinal tract from birth in order to ensure optimal production, reproduction and immunity. In fact, this process starts during pregnancy, as investing in the health of the mother, as well as the production of good quality colostrum and subsequent milk will get the new-born animal off to the best possible start.

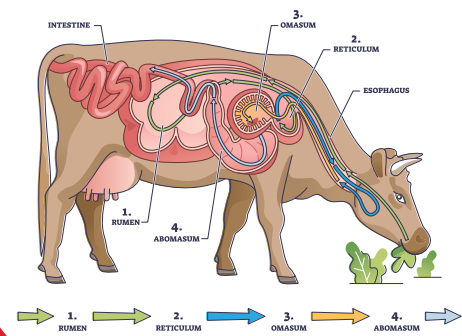
### A good start

Vaccinating mothers during the last trimester of pregnancy and ensuring that they are in optimal condition will ensure that sufficient amounts of colostrum with high levels of relevant antibodies are produced. Ensuring that the young animal takes in enough colostrum will then also help ensure that the animal is protected against disease, particularly disease that can affect the gut such as *E.coli* and clostridial infections, viral infections and to an extent protozoal infection. Protection from respiratory disease which can be fatal to young animals is also obtained from good quality colostrum.

Ensuring that mothers are vaccinated annually against relevant diseases, as well as vaccinating pregnant mothers in the last trimester with a registered and safe vaccine will ensure that sufficient antibodies are included in the colostrum produced by the mother. Clostridial bacteria are highlighted here as they are one of the leading causes of gut infections in young stock e.g. haemorrhagic enteritis (red gut or blood gut). A calf or lamb that is clinically affected by clostridial enteritis, even if it recovers fully, will likely never catch up to herd mates that we not affected.

Vaccinating pregnant mothers with a licensed and safe vaccine such as **Covexin® 10** or **Multivax P-Plus** will aid in providing protection from clostridial disease to the new-born animal. Other vaccines that can be considered include vaccines against respiratory pathogens such as *Pasteurella multocida* and *Mannheimia haemolytica*, e.g. **Bovilis® Vista Once SQ** in cattle and **Multivax P-Plus** in sheep.

## RUMINANT DIGESTION



Once maternal immunity starts to wane around 12 weeks of age, vaccination of young stock should be performed, so that they can start to develop their own immune system. In some cases it may be necessary to vaccinate before 12 weeks due to severe challenge, and some vaccines have been shown to be effective in spite of the presence of maternal antibodies. Consult your veterinarian for an appropriate vaccination program to use in your herd.

### Keep worms out

Besides consuming nutrition meant for the animal, nematodes (intestinal roundworms) can also physically damage the wall of the gut, leading to compromised integrity and increased susceptibility to secondary bacterial or viral infections. Diarrhoea and malabsorption are common consequences of worm infections. Severe infections with blood sucking species of nematodes can even lead to anaemia and death.

Worms in livestock should be managed actively and responsibly, using the correct products at the correct dose, at the correct times. Home remedies or "home brews" are seldom adequately effective and their safety cannot be guaranteed, neither for the animals or humans that consume their meat.

The cheapest product is also not always the most effective product and is not automatically considered good value for money simply because of a low purchase price. A few questions need to be asked: Is this product effective (think worm resistance)? Is it safe to animals and humans? What is the withdrawal period? How is it administered? How long is it effective for and against which species?

There are many worm remedies available on the market - oral, injectable or pour-on, and an expert in the field of internal parasite management should be consulted when designing an effective and sustainable internal parasite management program. Remember that new active ingredients are a dwindling resource, and our currently available active ingredients should be used responsibly to ensure their longer-term effectiveness..

### Protozoa?

Protozoa are single celled organisms, some of which are obligate parasites in production animals. Pertinent examples in South Africa are *Eimeria* spp. and *Cryptosporidium parvum*, which lead to diseases known as coccidiosis and cryptosporidiosis respectively. Both these diseases cause severe damage to the gut, causing a significant setback to clinical affected animals who subsequently never catch up to herd mates that were not clinically affected. It has been demonstrated in several clinical studies that growth rates and even milk production at first lactation are negatively affected after infections with these parasites.

Almost two thirds of coccidiosis cases are sub-clinical, meaning that animals do not show external symptoms but are indeed affected by the

parasite. Dairy calves are particularly susceptible, and all lambs raised on irrigated pastures can safely be assumed to have a problem with coccidiosis until proven otherwise. This particular disease is best managed metaphylactically with an effective product such as **Vecoxan®**. Treating animals metaphylactically in the presence of the parasite will help ensure that animals are given enough antigenic exposure to the parasite in order to develop immunity, without extensive damage to the gut being caused and avoiding the subsequent setback.

Cryptosporidiosis has become a significant problem in South Africa over recent years, with a large negative impact on calves and sheep on affected farms. The parasite is very difficult to eradicate and prevention and treatment is labour intensive and often expensive. If cryptosporidiosis is suspected on a particular farm, the diagnosis should be confirmed by a veterinarian, who will then also discuss prevention and treatment protocols, along with other measures such as cleaning, biosecurity and general animal management.

### What about supplements?

There exists a plethora of nutritional supplements for production animals available on the market, whether appropriately registered or not, all making a variety of claims. It is important to carefully assess what claims are being made on the label and if the ingredients listed on the label do indeed support such claims or allusions to benefits.

With particular reference to the subject of gut health, supplements that are beneficial to the gut such as protectants and probiotics should contribute to maintaining the gut in optimal condition. Supplements are not just limited to preventative products, but also include adjunctive therapies used in sick and convalescing animals which support the gut, reducing symptoms such as diarrhoea and malabsorption and well as providing vital energy and promoting digestion and absorption.

A product such as **Immunovite®**, which contains Fulvic Acid and Probiotics amongst other beneficial ingredients, can be used strategically to support growth and immunity, as well as therapeutically during illness or during stressful procedures such as general husbandry or vaccinations.

### A holistic approach to gut health is essential



This article clearly lays out the case for expending significant effort as well as investing time and money into ensuring optimal gut health for long term benefit. The gut can be considered akin to a specialist broker in the field of adding value to animal feed by producing animal protein. Keeping the gut as healthy as possible, starting from the womb, will protect your investment and assist in extracting maximum possible profits from your production animal business.



**COVEXIN®10** Reg. No. G3354 (Act 36/1947) Namibia Reg. No. V05/24.4/413 [NSO] COMPOSITION: Contains strains of *Clostridium perfringens* types A, B, C and D, *Clostridium chauvoei*, *Clostridium novyi* type B, *Clostridium septicum*, *Clostridium tetani*, *Clostridium novyi* type B, and formalin killed cells and toxoids of *Clostridium chauvoei* and iron-regulated antigens from the epidemiologically most important serotypes of *Mannheimia (Pasteurella) haemolytica* and *Pasteurella trehalosi* in buffered physiological saline adsorbed onto aluminium hydroxide. Preservative: Thiomersal.



**MULTIVAX-P PLUS** Reg. No. G3694 (Act 36/1947) Namibia Reg. No. V06/24.4/183 [NSO] COMPOSITION: Combined 7-in-1 Clostridial plus *Pasteurella* vaccine. An opaque fluid vaccine containing toxoids of *Clostridium perfringens* types B, C and D, *Clostridium septicum*, *Clostridium tetani*, *Clostridium novyi* type B, and formalin killed cells and toxoids of *Clostridium chauvoei* and iron-regulated antigens from the epidemiologically most important serotypes of *Mannheimia (Pasteurella) haemolytica* and *Pasteurella trehalosi* in buffered physiological saline adsorbed onto aluminium hydroxide. Preservative: Thiomersal.



**BOVILIS® VISTA ONCE SQ** Reg. No. G4061 (Act 36/1947) COMPOSITION: Modified live cultures of bovine rhinotracheitis (IBR) virus, bovine virus diarrhoea (BVD) virus (type 1 and 2), parainfluenza 3 virus (PI3), bovine respiratory syncytial virus (BRSV) and avirulent live cultures of *Mannheimia haemolytica* and *Pasteurella multocida*.



**IMMUNOVITE** Reg. No. V24724 (Act 36/1947) COMPOSITION: Each 100 ml contains *Bacillus amyloliquefaciens* CECT 5940  $2 \times 10^9$  CFU, Fulvic acid 20 000 mg, Selenium, as organic chelated proteinate complex 5 mg, Magnesium 500 mg, Calcium 720 mg, Sodium Chloride 775 mg, Potassium Chloride 550 mg, Metabolisable energy 200 KJ, Vitamin A 100 000 IU, Vitamin D<sub>3</sub> 5 000 IU, Vitamin E 300 IU, Vitamin K<sub>2</sub> 20 mg, Vitamin B<sub>1</sub> 25 mg, Vitamin B<sub>2</sub> 40 mg, Vitamin B<sub>6</sub> 50 mg, Vitamin B<sub>12</sub> 0.3 mg, Vitamin C 300 mg, Niacin 200 mg, Pantothenic acid 60 mg, Folic Acid 13 mg and Biotin 1 mg.



**VECOXAN®** Reg. No. G1405 (Act 36/1947) COMPOSITION: Diclazuril 2,5 mg/ml

