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Unrestricted wild animals will do many things to balance their mineral diet, mainly by eating a variety of plants, trees and soils. Elephants in Malaysia, before fencing them out, travelled a hundred kilometres, eating as they went, to consume salt in a cave. It took a while to work out why they went into the cave.



Restricted domesticated animals sometimes try to get sodium by licking each other for the sodium in perspiration, as shown here. Salt is in saliva to aid digestion and help with the control of body temperature. It helps give the sheen on the coats of animals. Originating from the sea gives it more minerals that even kelp, which only has what it takes up, which includes a lot of mercury and other toxic elements. When I was taking kelp for the iodine, I got an itchy and sore back, caused by its heavy metals. Get everything measured for heavy metals.



Cattle and wild deer in Ohio ate this subsoil, which was found to be high in cobalt, but low in the area, an essential element for ruminants to make vitamin B12, but not much is needed by horses. Some deficient animals try to get minerals by eating poplar tree bark, treated posts, and even stones, as shown here. The hair growing on the top of this cows neck shows that she is low in cobalt. Her sad eyes indicate low magnesium. Her lack of sheen shows low sodium, copper, zinc and possibly other elements. The slight swelling under her jaw could indicate internal parasites rising up the throat. They thrive in mineral deficient animals.



Calves have run up to drink from a trough after they see the farmer add Solmin minerals, containing nine essential minerals.



This was the Pukeroro Stud, before I consulted for owner Bill Chynoweth. His cows and farm on the right improved to this stage in 18 months. The whole herd had

changed from lacking sheen, thanks to applying LimePlus and feeding the eight minerals in the Solmin soluble mineral mix, which has the best salt available that contains about 50 of its own minerals. Pasture and Milk production per cow and total per herd increased. Look at the low set tail on the low selenium cow and the dung spread by the weak tail on to the body, and the clean body on the right cow. His 100% healthy well developed New Zealand Holstein cows were always so correctly fully fed all year. Look at the body size and sheen. This herd produced 517 kg of milk solids

per cow, and 1,468 kg per hectare from mostly pasture and no grains. Maize silage was made and fed during lean periods in summer and winter. No pasture was damaged or wasted from grazing too many cows. Look at the quality of this 30 year old dense pasture that has been correctly limed, never had artificial nitrogen and never been over-grazed. It is a high feed value healthy pasture because it has mostly succulent pasture with a little roughage that animals need. Use the spreadsheet 'Dairy Cow Numbers for Max Profit' to achieve this and increase your profit. To look like this, animals must have all minerals at optimum levels. The sheen proves this. The highly-held clean tail (look closely) shows that the cow's selenium level is correct. Selenium helps muscles, so heads and tails are held higher.

In the 2012/13 drought season, I asked a new client close to Hamilton, who wants to remain anonymous, if he knew how much it costs to grow and feed maize silage. He used the 'Costs of Pasture, Silage, Hay, Crops & Nitrogen' spreadsheet to find that making maize silage, costs \$6,821 per hectare. So he stopped making it, reduced his cows from 600 to 500, spread 4,000 kg of LimeMagPlus per hectare on his 177 hectares and stopped buying concentrates, and made the most profit with no stress and less work. On 28 October 2012, they stopped feeding a soluble mineral mix that contained manganese, and started feeding Solmin. The herd calmed down from stressed cows and mastitis decreased from 30 a day to one.

The good vets (and doctors) of the future will give little medicine, but will be interested in their patient's care, feeds (including minerals), and in the causes and preventions of sicknesses and diseases, rather than just treatments.

Regulations and penalties

In New Zealand, and many other countries, there are strict regulations and severe penalties regarding the treatment of animals, the use of drugs and their effects on food. Rules are essential for obvious reasons and should not be ignored or abused. The treatment of animals can affect them and consumers, so read and adhere to all the instructions on products.

In some countries, records of all treatments have to be kept by farmers and checked by inspectors. Some farmers may think that these regulations are over-done, but there are people who are allergic to some antibiotics and drugs, so all traces of these must be kept out of food.

Even if you don't have to in your country, do keep records of treatments as part of good husbandry and for referral purposes; our memories are not always one hundred percent.

With mastitis and other antibiotic treatments, set up recording and animal marking (identifying) systems when treated to avoid mistakes and drugs getting into the human food chain.

Most farmers are producers of human food. We expect all companies processing human food and those with food outlets to adhere to strict hygiene regulations, so all farmers should do the same from the source of food - the farm.

Being your own vet

The value of animals and the cost of keeping them healthy is high, relative to the profit. Also, there are areas where vets are not available, or so far away that the total cost of a visit can be more than the value of the animal. For these and other reasons, such as a stitch in time, farmers need to do as much as possible themselves.

There are many suggestions for home made mixtures of how to cure or prevent animal sicknesses. Before trying any item on any food producing animal, be aware that in most countries no product which is not registered with an approval authority is allowed to be fed to, or used on an animal.

In New Zealand, the Animal Remedies Board, now the Agricultural Compounds and Veterinary Medicines (ACVM) Act 1997, controls all items of fertilisers and food imported and fertilised or fed to food producing animals. A registration number must be displayed in all advertisements and on all containers.

The first thing is to have a supply of medicines in stock, and the second is to identify sicknesses before animals have become too sick. Know when and how to use medicines, and train your staff to also be proficient in this.

Things you should know

- An antibiotic works against bacteria.
- An antiviral vaccine targets a virus.
- Coccidiostats are antibiotics that target a bacterium.
- Use a new or clean needle for each animal when doing injections in herds where animals have

infections or have been brought in.

The following chapters should help, but good vets will be far more experienced and skilled, so should be used whenever necessary.

Healthy animals

Cattle should hold their heads up above their backline, except when eating or walking, and have hair that is smooth, even, strong-coloured (Herefords sharp red and white, Friesians sharp black and white, Jerseys rich coloured, etc.), all with sheen.

Hooves should be shiny and crack-free, strong and upright, not flat back on their heels. See Hooves & Lameness.

When cows are healthy, 1,000 can calve with few, if any, problems. One of my best clients, with one helper, calved 800 in seven weeks with only one (the same cow each year) getting milk fever. He and one helper calve and run the farm. They have a rotary, in which one milks in the morning and one in the afternoon, and they change each week. The other one brings in and returns the three herds, etc. They are 100% grazing and buy no feed.

Remove Synthetic Items

Avoid giving animals access to plastic and similar synthetic items, because they seem to love chewing them and, if swallowed, can form a ball which then attracts hair and can grow into a large obstruction. Baling twine is a major cause of this. Pieces of plastic sheet from silage stacks can be swallowed and then open in the rumen which prevents access to it.

Overcrowding

The worst enemy of an animal is another one of similar type. Therefore, overcrowding can be disastrous, as is shown in the following report on fish farming in Canada.

Eric Wickham, Executive Director of the Canadian Sablefish Association, writes that, as anyone familiar with the controversy around fish farming knows, the biggest concentration of fish farms in British Columbia is in the Broughton archipelago, and the surrounding ocean waters north east of Campbell River have proven lethal to legions of young, wild pink salmon in recent years.

Wickham says that wild fish dying in droves near aquatic feedlots is no surprise. The deaths of thousands of chickens, and the forced slaughter of millions more to control the recent avian influenza outbreak in the Fraser Valley, show that bad things happen when large numbers of living things are tightly packed together.

On today's fish farms, a million or more salmon may be enclosed in a series of pens, which act like magnets for pests and diseases. What's more, because the fish are "kept safe" from predators, there is no natural culling of diseased fish, so problems amplify and spill into surrounding waters.

The horrific images of small wild pink salmon, pulled from waters adjacent to fish farms and covered in sea lice and bloody lesions, is a recurring public-relations nightmare for the industry.

Fish retailers and restaurateurs have lamented the comparatively bland taste and mushy texture of farmed salmon. Many, respecting their customers' wishes, have made it a public policy that they will not serve farmed fish.

Animal farmers should keep mobs as small as profitable and check them regularly and thoroughly for diseases and ailments.

Facts Linking Animal and Human Feeding and Symptoms

I have read that animal and human feeding and symptoms can't be related, but -

1. Excessive Se causes the same sweet sickly acetone (like nail varnish) smelling breath in both.
2. Gorging gives both a tummy ache.
3. Low Zn causes both to have bad skin, hair and hooves/nails.
4. Excess nitrates causes both to have health problems.
5. Low iodine causes similar symptoms.
6. Low Cu causes colourless hair. Humans go grey prematurely.
7. A lack of variety is bad for both.
8. Food can't supply enough of some minerals such as salt.
9. Both have problems if too fat or too thin.
10. If unfit, both take longer to give birth. Grazing animals are slimmer and fitter.

Probiotics

Probiotics is a general term that refers to the natural bacteria normally found in the stomach or

intestine of healthy animals. When an animal becomes sick, disease-causing bacteria called pathogens replace the normal bacteria.

Some people are concerned about antibiotics possibly making us immune to their use. Antibiotics kill or inhibit harmful bacteria, while probiotics are beneficial bacteria used to overwhelm harmful bacteria. Their use could actually reduce the need for antibiotics.

Probiotics are sometimes recommended for newly born animals because they have no intestinal bacteria, so treating with probiotics helps establish a good set of bacteria before pathogens arrive. Treatment may help during times of animal stress.

Probiotics are not claimed to be a wonder drug, but a preventive. Disease can still occur despite their use, and if it does, an antibiotic would likely be needed to kill the pathogens. Then normal bacteria could be re-established to reduce the possibility of future illnesses.

Public concern over food safety has encouraged more research into natural, non-harmful bacteria to prevent pathogens.

[Chelating](#)

Read the chapter call Chelating in Minerals in Animals which uses the highly toxic mercury.

[Blood, Liver and Urine Levels](#)

The cost of getting blood and liver tests done on an annual or even twice yearly basis is low compared with the possible loss of growth and production from animals which are deficient or over-supplied with an element, such as the high amounts of copper and manganese in Palm Kernel Extract (PKE).

I and some others, including USA and UK nutritionists, consider are low levels of some elements. Try checking your last tests against your cows' production, beef weight gain and looks, and you are likely to find that the cows which are milking or gaining well have higher than recommended levels of some elements, while the low producers and those with unhealthy looking hair, generally have lower levels of some elements.

Animals grazing one pasture species in one area are more likely to suffer mineral deficiencies than when fed a variety of feeds from different areas, as occurs with bought in feed for confinement feeding, which usually has minerals added.

Mineral imbalances cause many problems and decreased animal production. Some vets are happy with low levels, but I am not; I want optimum levels. To succeed in life and farming, aim NOT for the average, but for the BEST.

When getting blood tests, get just 6 animals sampled to save money. Check two high-producing, healthy looking animals; two low producing or slow growing animals and two average animals.

Ask for blood tests to include selenium, vitamin B12 (for cobalt levels), magnesium, phosphate and urea. When getting liver tests from slaughtered animals, get copper, cobalt, liver fluke, energy and nutrition, and in autumn also get facial eczema and toxin damage. Cu blood tests are unreliable because Cu levels change soon after consumption. Cu liver tests are reliable. See the Blood, Liver and Urine Levels Spreadsheet.

Element levels in blood change after exercise, stress, heat, cold, minerals in licks or water, and concentrates with premixes, so livers give more accurate figures. Parasites and other ailments can affect animals so severely that mineral deficiencies occur through starvation and/or inability to absorb or synthesise them.

Very high Blood Urea Nitrogen (BUN) levels (above 45 mg/dl) can cause below average embryo survival and pregnancy rates, despite good submission rates. Applying too much artificial nitrogen and grazing very lush short pastures can accentuate high blood urea levels. Normal BUN levels are between 15 and 20 mg/dl. Low is below 15 and high is above 25.

Another measuring system is Milk Urea Nitrogen (MUN). Also see Animal Health>Toxins>Nitrates and the Blood & Liver Levels spreadsheet.

[Biopsies for Liver Tests](#)

Vets usually use a local anaesthetic or sedative and, after a few minutes, the farmer will lift the animals tail to steady it while the vet inserts a biopsy tool in between the 10th and 11th ribs on the right side. The biopsy tool is a long needle with a handle. No stitches are required after it, but animals can suffer slight after effects, so preferably sample from slaughtered animals' livers.

Blood and liver levels should be measured at drying off to make corrections and after calving to monitor the dry period feeding levels. A top Waikato, NZ, herd did this as I recommend, i.e. had three high producing, three average producing and three low producing cows (not any five animals as usually recommended by vets) tested and wrote their production levels next to their milk production figures as below. The following figures are for selenium, but can apply to other items.

Production	Se nmol/kg
High producing cow	1,400
High producing cow	1,200
High producing cow	1,100
Average producing cow	1,000
Average producing cow	1,000
Average producing cow	1,000
Low producing cow	1,000
Low producing cow	990
Low producing cow	830

The grazed pasture, providing 100% of the feed, had Se levels of 0.19 ppm from Selcote Ultra fertilising. Also, 50 grams of soluble mineral mix with the maximum allowed Se, was being given per cow per day through the drinking water. These figures show the importance of adequate Se to achieve high milk production.

Had the farmer taken his vet's advice and tested any 5 cows he could have missed the two low ones and not been able to do his own research into optimum levels. The vet expressed concern about the cow with 1,400 S:Se nmol /kg, but she was milking well and looked a picture of health. She held her head the highest and had the shiniest coat.

Dangerous Diseases

The laws of most countries require immediate notification of contagious diseases. If an animal dies for no known reason, treat it with care and phone your vet and appropriate government department. Have both their phone numbers handy.

Vets should know the symptoms of all diseases, but they can be a long way away and, with some diseases, urgency of identification and action are imperative. The following are very brief descriptions of some dangerous diseases to assist you with identification.

Anthrax

Animals can start by being lethargic, then recumbent and can be dead by nightfall. Swelling in the neck area and increased salivation can occur.

Eating Anthrax meat or blood, or even having contact with blood, can kill people very quickly. Africans drinking blood from affected animals have died in a day. Immediate symptoms are abdominal pain and diarrhoea, then intense itching and swelling around the body.

Anthrax bacteria can survive in soil indefinitely. A duration figure of 50 years has been documented.

This is a notifiable disease in most countries so contact your vet.

Blackleg

This is an acute disease of cattle and sheep characterised by swellings, usually in the heavy muscles. Spores are eaten in soil-contaminated pasture, some of which pass into the bloodstream and are distributed into muscle tissue, where they stay doing nothing because muscle has oxygen, until an injury or bruising of muscle causes a drop in oxygen. The result is a dead animal, often found only a day after handling, and often a healthy one; sick ones are seldom seen.

Symptoms include black spots on the legs of livestock, that can die shortly after infection, swellings of the heavy muscles, and smells. Most cases occur in cattle between six months and two years old.

Contaminated pasture can be a source of organisms, and pumping sludge from ponds can spread spores. More than 5,000 cattle died in one province in Zimbabwe in one month in 2002, under drought conditions when animals were grazing closer to the soil.

Vets should always be used and dead animals should be disposed of by burying deeply or removing them off the farm.

Multi vaccines are available and should be used to control Blackleg, Leptospirosis and others, particularly if there is a history of Blackleg. Manufacturers like Pfizer, Schering-Plough, will send vaccines on request within a day or two. If the risk is high, calves need to be done at set intervals.

It is found worldwide but does not affect humans.

[Blue Tongue \(BT\)](#)

This is an infectious, non-contagious, viral disease of sheep and domestic and wild ruminants, such as goats, cattle, deer and most species of African antelope. It is more common in cattle than in sheep, and the signs in cattle are much milder than in sheep. It is not known to affect humans.

BT is caused by a virus, of which there are many. It is not transmitted by direct or indirect contact between animals in the absence of the insects. The infection is not noticed in the majority of infected animals. Susceptible breeds can suffer mortality rates of 50%.

Symptoms include: inflammation of the mucous membranes, congestion, swelling and haemorrhages. Sheep are generally the worst affected, while cattle and goats may not show clinical signs, but can carry the virus and transmit it to other ruminants.

[Displaced Abomasum \(DA\)](#)

Cows' natural fitness from grazing good pasture can reduce the likelihood of displaced abomasums, which are almost unheard of in New Zealand. This is where the cow's fourth or true stomach becomes bloated with gas, fluid, or both, and shifts to an abnormal position inside the body.

Symptoms include reduced feed intake, lower milk production, loss of body weight, mild ketosis, scant bowel movements, normal temperature, listlessness and general discomfort.

Treatment usually requires abdominal surgery to correct the displacement. It is a fairly simple operation in which the veterinarian sews the stomach to the abdominal wall so displacement cannot recur. However, if left untreated, it will kill the cow.

DA can be caused by too much bought feed or finely chopped (under 70 mm) feed, especially if fed into empty stomachs or too much at one meal and not enough longer material WITH IT. Use your nutritionist and veterinarian to work out a feed programme to avoid problems. When on adequate length pasture, hay and/or correct length silage, the occurrence of DA is almost nil.

Where first-calvers or springers (fresheners) are run on dry feed, and then brought into the milking herd which is on lush feed, fine cut silage and bought feed, they can suffer digestive disturbances and DA, especially if over fat.

DA's can occur within a month of calving and occur more frequently in cows fed high-concentrate, low-forage diets, and in those fed finely-chopped feed.

Theories for the occurrence range from over-fat cows to insufficient long forage. Over-fat, unfit, confined cows can show a reduced appetite after calving. This limits intake so reduces the muscle tone of the rumen. Low-fibre diets will also reduce rumen muscle and fill. The severity of the displacement varies between cows.

[Foundering](#)

This occurs mostly in horses, most of which have the ability to over-eat. As with humans, over-eating strains and kills. Reduce the lush pasture by reducing nitrogen fertilising, grazing it when longer, and sowing coarser, less palatable grasses such as cocksfoot (orchard grass).

[Foot & Mouth Disease](#)

See Diseases > Foot & Mouth Disease.

[Hardware Allergy](#)

These can usually be detected by the way the cow walks, which will be stiffly and gingerly as if in pain, and sometimes she will kick at her side. She will usually lie on her right side and display discomfort. Hardware cows may have a slightly elevated temperature because of infection from the internal injury. Manure may be runny, and because of the low appetite, could smell.

Call the vet because it's a serious condition. Sometimes there is nothing you can do.

[Oedema](#)

Flushed (fed on grain based feeds or too much good pasture) and first-calvers, calving at well over 2 years of age, are more likely to suffer oedema.

Symptoms include swelling under the skin in front of the udder, spreading forward.

Causes include: high energy diets; excessive sodium or potassium and/or flushing (extra feeding

before calving); dead calf in a cow causing her to make milk, but not be milked; genetics; and feeding sodium bicarbonate when the cows are dry.

To prevent oedema: calve at two years; don't force feed before calving; and ensure balanced feeding with balanced pasture and hay or silage before calving, rather than too much high clover pasture on its own, although oedema is not common on pasture as it is with **BF** feeding.

If symptoms start - remove some milk. Ensure the cow has not calved, or that calf has not died, causing the cow to produce milk which is not taken away.

Placenta Retained

If a small amount of the placenta is seen hanging from the uterus or puss exudes, the cow will not have cleaned correctly. Very few healthy fit grazing cows with adequate mineral (especially selenium) levels have this problem.

There are many causes including infections, aborting, low calcium, selenium and/or iodine, a short dry period and low protein intake.

To prevent this occurring, avoid deficiencies, stress and infectious causes of abortions.

To treat this - an injection of oxytocin (milk let-down hormone) can release it, but have a vet check her for infection and complete cleaning, or she could be hard to get in calf.

Respiratory Illness

Respiratory illness can occur in housed calves and lambs after immunity protection from colostrum antibodies have diminished and newly created antibodies are not yet preventing infection. All animals can get it from stress when transporting, mixing, weather changes, poor ventilation and inadequate nutrition, especially mineral deficiencies.

Treatment should be accompanied by good feeding, feeding Solmin, reducing stresses and using antibiotics. A vet should be called.