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September 2026 edition

EpiHerd Reports 2.0 - “Families”

Biological process family (“group”) assignments and action logic

In biology, each process in a living cell involves many steps and multiple gene products (proteins). Each process has a dedicated function, for example for digesting carbohydrates, raising an immune response against infection, responding to heat stress, maintaining mineral homeostasis or coping with environmental and toxic exposures.

The report currently groups biological processes under six broad headlines:

- Rumen Health
- Stress
- Immunity
- Energy Metabolism
- Fat Metabolism
- Environmental and Toxic Exposures

Each biological process can appear under more than one headline. This is intentional and biologically correct. The same process can support several cow-level headline functions depending on context. Repeated placement therefore reflects biological interconnection and the importance of the process rather than duplication.

Important about the interpretation: These results should not be read as simple deficiency findings. They show biological pressure the cows are under. Standard feeding recommendations are designed for baseline requirements under normal conditions. High-producing, fresh, inflamed, heat-stressed, overstocked or metabolically loaded cows are not in normal conditions.

When gene expression data show such pressure, the cow may need more support than standard ration recommendations suggest. A ration can be correct on paper and still be insufficient for the biological load the cow is carrying. Use current global recommendations as the baseline and challenge whether delivered intake, absorption, utilisation and environmental conditions allow the cow to meet that demand.

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1. Rumen Health

Rumen health signals mean that the rumen microbiota is under stress. Signs of rumen distress are often first seen as poorer feed efficiency. A practical benchmark is approximately +1.5 kg of milk per 1 kg of dry matter intake, interpreted in the context of stage of lactation and milk composition.

Rumen function drives energy supply, microbial protein synthesis, fibre digestion, milk fat production, water use and mineral/vitamin availability. Common visible signs include loose manure and subclinical or clinical rumen acidosis.

Biological process about…	**How is it connected?**
Carbohydrate Metabolism	Rumen fermentation of carbohydrates produces volatile fatty acids, the main energy source for dairy cows.
Protein Metabolism	Rumen microbes break down dietary protein into smaller building blocks and use them to rebuild microbial protein, a major amino acid source for the cow.
Fat Metabolism	Rumen microbes modify fatty acids through biohydrogenation, affecting milk fat synthesis and fatty acid supply.
Hydration	Water intake supports rumen fill, fermentation, feed intake and passage rate, as well as milk yield.
Magnesium	Magnesium absorption and availability are affected by rumen conditions, potassium levels and dietary antagonists.
Biotin (Vitamin B7)	Biotin is linked to rumen microbial synthesis and supports epithelial, hoof and metabolic functions.
Cobalamin (Vitamin B12)	Cobalamin synthesis depends on rumen microbial activity and cobalt availability.
Riboflavin (Vitamin B2)	Riboflavin is linked to microbial metabolism and cellular energy reactions.
Choline	Rumen metabolism degrades much of dietary choline. Insufficient choline absorption limits the body's cellular function and the transport of fat out of the liver.
Linoleic Acid	Linoleic acid is modified in the rumen and can affect milk fat synthesis and inflammatory balance.
Alpha Linolenic Acid	Alpha-linolenic acid is modified in the rumen and reflects forage fatty acid supply and rumen biohydrogenation.
Heat Stress	Heat stress reduces dry matter intake, changes eating behaviour, rumen fermentation and the rumen microbiome, increasing the risk of rumen instability.

Biological process about...	How is it connected?
Metabolic Stress	Reduced intake, high concentrate pressure and metabolic strain can increase the risk of rumen instability, subacute ruminal acidosis and milk-fat depression.
Mycotoxins	Feed-borne mycotoxins may reduce intake and digestibility, alter gastrointestinal and rumen functions. The mycotoxins may harm the microbiome and the integrity of gastrointestinal epithelial wall too. However, visible mould is neither necessary nor sufficient to confirm exposure.
Heavy Metals	Chronic toxic-element exposure can reduce appetite and alter gastrointestinal function and microbiota; suspected exposure requires source investigation rather than nutritional guesswork.

Rumen Health - Guidelines for veterinarians and nutritionists

Check first:

- feed availability: all cows should be able to eat at the same time, and good quality feed should be available all the time
- dry matter intake: monitor kg dm/cow/day by group (lactating, newly-calved and full-term cows separately) and compare intake to yield level, lactation stage and feeding plan goal
- make sure the feed does not separate; ensure that it is of good and consistent quality, and ask the feeding specialist to mix the feed.
- cow's eating time should be about 3-5 hours per day, in about 10-14 eating bouts
- cow's lying time should be about 11-13 hours per day
- rumination time should be about 7-10 hours per day
- manure assessment: is the manure loose, watery, slimy, dry or hard; is grain or fiber coming through? Ask the nutritionist to wash the manure using a three-compartment manure shaker
- check if the fat content of the milk has changed
- Clean water should be available 24/7 even when the cows are dried off and and throughout the drying-off period
- silage hygiene: is the mixture warming up? Is there visible mould in the feed components, i.e. a mycotoxin risk? Test the feed for mycotoxins if you suspect their presence

Be bold: The cow does not eat the feeding plan or formulation, but the feed that is distributed to it. An imbalance in the rumen can make what looks good on paper biologically inadequate.

If rumen health is a concern, first protect the rumen microbial activity, maximise dry matter intake and ensure sufficient fibre, and discuss with a nutrition expert options for the use of rumen buffers and optimise the balance of the basic feed where possible. Our team is happy to help – contact our customer service team!

2. Stress

Cow loves routines!

A cow experiences stress on many different levels. Stress can be caused by housing conditions, the hierarchy of the pack, heat, overcrowding, insufficient feed-bunk or water-trough space, management and human behaviour, or repeated disturbances and changes in the environment. The cow's body also experiences stress when the animal has an infection, does not receive enough energy, has been exposed to toxins in the feed, or when transition-period feeding has been challenging and we have not succeeded in supporting the cow through the enormous physiological change from a dry cow back to a lactating cow.

When the EpiHerd's gene expression test detects stress-related issues, it indicates that the cow has adapted its physiology in response to an external or internal burden in order to maintain function and cope with the situation. This adaptation requires energy, leaving less available for milk production, growth, reproduction and recovery.

Biological process about…	How is it connected?
Inflammation	Inflammation is a major biological stress response and increases nutrient demand. It may also reduce feed intake, water intake and appetite.
Hydration	Dehydration or poor water access increases physiological stress, reduces feed intake and weakens thermoregulation.
Magnesium	Magnesium is relevant to neuromuscular function, stress response and mineral balance.
Calcium	Calcium is essential for neuromuscular function and gastrointestinal motility. Impaired calcium homeostasis around calving increases physiological and metabolic stress.
Phosphorus	Phosphorus is required for cellular energy transfer and skeletal mineral homeostasis; marked or prolonged imbalance can reduce appetite, activity and performance. Deficiency can lead to recumbent cows especially seen during late lactation.
Selenium	Selenium supports antioxidant defence during oxidative and inflammatory stress.
Zinc	Zinc supports tissue integrity, immune defence and recovery under stress.
Vitamin C	Vitamin C demand increases during oxidative stress, heat stress, inflammation and disease recovery.
Vitamin D	Vitamin D is involved in mineral metabolism, immune regulation and inflammatory balance.

Biological process about…	How is it connected?
Vitamin A	Vitamin A supports epithelial barriers and immune resilience during stress.
Vitamin E	Vitamin E acts as a major antioxidant and protects cell membranes from oxidative damage during transition, heat stress, inflammation and high production.
Iron	Iron is important for oxygen transport, inflammatory regulation and metabolic stress responses.
Glutamine	Glutamine is used heavily by immune and gut tissues during stress and inflammation and supports intestinal integrity.
Tryptophan	Tryptophan metabolism changes during inflammation and stress.
Leptin	Leptin is involved in energy reserves, appetite, immune function and stress adaptation. Low leptin can reflect negative energy balance and mobilisation of body reserves.
Choline	Choline supports liver function, methyl metabolism* and cell membrane integrity during metabolic stress.
Fat Metabolism	Stress changes fat mobilisation, liver load and energy use.
Carbohydrate Metabolism	Stress increases glucose demand and changes energy use, especially during heat, disease or inflammation.
Heat Stress	Heat stress is a direct whole-body stressor that increases thermoregulatory demand, reduces intake, disturbs hydration and electrolyte balance and increases inflammatory and oxidative pressure.
Metabolic Stress	Metabolic stress reflects a mismatch between nutrient demand and metabolic capacity and is especially important in transition and early lactation.
Heavy Metals	Toxic-element exposure is a biological stressor that may cause gastrointestinal, neurological, hepatic, renal and systemic effects.
Mycotoxins	Mycotoxin exposure can create gastrointestinal, hepatic, metabolic, immune and reproductive stress, often with non-specific herd-level signs.

Stress - Guidelines for veterinarians and nutritionists

First check the environmental conditions:

- light, noise, animal treatment, ventilation, slipperiness, manure humidity and barn hygiene
- animal numbers vs. bedding and feeding and drinking space, water availability

- animal grouping, that the animals should have good visual contact throughout the barn and with the other animals in their group, with sufficient space and opportunity to move away quickly and safely.
- transfer practices (minimum changes)
- lameness
- lying time, lying comfort
- infection pressure
- temperature at cow level
- possible toxin exposures.

Nutrition focus:

- secure dry matter intake during heat and transition stress
- stabilise rumen function
- increase antioxidant support when signs of oxidative stress are present
- check selenium, vitamin E, vitamin C, zinc and magnesium as needed
- assess calcium and phosphorus balance especially during transition
- avoid excessive starch pressure during stress
- support new calves with adequate energy, amino acids, choline and liver metabolism support
- reduce the root cause of stress; do not try to solve the problem with supplements alone
- address environmental and toxin exposures if herd-level symptoms remain unexplained

Be bold: Stress increases maintenance energy requirements and often reduces feed intake at the same time. So the cow needs more nutrients at the very time when she is eating less. We strongly suggest the feeding expert take this into account in both mineral and energy feeding according to your results. Our team is happy to help!

3. Immunity

Immunity signals mean the cow is using resources for defence against pathogens, inflammation control, barrier protection or tissue repair. Immune activation is biologically expensive and can redirect nutrients away from milk production, fertility and growth.

Biological process about...	**How is it connected?**
Inflammation	Inflammation is part of immune defence and increases nutrient cost.
Zinc	Zinc supports epithelial barriers, immune-cell function, local udder defence and wound healing.
Selenium	Selenium supports antioxidant enzymes and immune resilience.
Vitamin A	Vitamin A supports epithelial integrity, mucosal defence and immune function.
Vitamin C	Vitamin C supports immune-cell activity and provides antioxidant protection.
Vitamin D	Vitamin D regulates immune responses and inflammatory balance.
Vitamin E	Vitamin E supports immune-cell function and defence against infections, especially during the transition period.
Calcium	Adequate calcium homeostasis supports immune-cell function; hypocalcaemia has been associated with impaired neutrophil adhesion and phagocytosis and greater postpartum disease risk.
Iron	Iron is important in oxygen transport and immune-cell function, but is tightly regulated during inflammation.
Folate (Vitamin B9)	Folate supports DNA synthesis and immune-cell proliferation.
Cobalamin (Vitamin B12)	Cobalamin supports methyl metabolism*, cell division and immune-cell function.
Glutamine	Glutamine is a key fuel for immune cells and gut barrier tissue.
Tryptophan	Tryptophan metabolism is altered by immune activation and inflammation.
Methionine	Methionine supports methylation, antioxidant capacity and immune-cell function.
Lysine	Lysine supports protein synthesis, including immune proteins and tissue repair.

Biological process about…	How is it connected?
Protein Metabolism	Immune activation increases demand for amino acids and acute-phase protein synthesis.
Mammary Gland	The mammary gland is an immune-active tissue, especially during somatic cell count (SCC) or mastitis pressure.
Multivitamins	Broad vitamin pressure may reflect increased immune, antioxidant and tissue-repair demand.
Riboflavin (Vitamin B2)	Riboflavin supports cellular energy reactions relevant to immune-cell activity.
Biotin (Vitamin B7)	Biotin supports epithelial integrity and metabolism, indirectly supporting immune barriers.
Heat Stress	Heat stress increases inflammatory and oxidative pressure and may weaken disease resistance, especially when intake and hydration are compromised.
Metabolic Stress	Excessive lipid mobilisation, ketosis and oxidative imbalance can alter immune-cell function and increase susceptibility to postpartum disease.
Heavy Metals	Prolonged toxic-element exposure may reduce immune resilience and increase susceptibility to infection.
Mycotoxins	Several mycotoxins can alter immune responses and may increase susceptibility to infection depending on toxin, dose and duration.

Immunity - Guidelines for veterinarians and nutritionists

Check first:

- somatic cell count (aim for under 150,000)
- mastitis (aim for less than 10% of the herd requiring treatments)
- metritis (target below 3%)
- retained placenta (target below 1%)
- hoof diseases
- milk fever (minimum target below 3%)
- transition-period problems (if there is ketosis, and how well are the cows ramping up milk production)
- assess bedding, barn hygiene, ventilation, stocking density, and any potential exposure to toxins

Nutrition focus:

- increase antioxidant support when immune/inflammation signals are present

- review selenium and vitamin E together; use herd-appropriate selenium monitoring from bulk tank milk (preferred levels depend on your production, but under 30 µg/L is always low for a modern herd)
- review zinc and copper balance and trace-mineral bioavailability
- check vitamins A and D (prefer Hy-D 25-hydroxyvitamin form) in dry and lactating cows
- secure energy and protein supply because immune activation consumes nutrients
- review methionine, lysine, glutamine and tryptophan in the context of immune load
- review calcium status where transition disease or hypocalcaemia pressure is present
- do not rely solely on supplements; simultaneously reduce infection, heat, and toxin pressure

Be bold: immunity is nutrient-expensive**.** Inflammation is not free. Cows fighting infection, inflammation or tissue damage use more glucose, amino acids, energy, selenium, vitamin E, vitamin A, vitamin D, zinc, copper and antioxidant capacity than a normal baseline ration may cover. We're here to help – don't hesitate to contact your customer service representative for additional vet and nutritionist consultation!

4. Energy Metabolism

Energy metabolism signals mean the cow may not be meeting production, recovery or transition demands efficiently.

Biological process about…	How is it connected?
Carbohydrate Metabolism	Carbohydrate metabolism provides glucose precursors and supports energy production.
Fat Metabolism	Fat mobilisation and fatty acid oxidation support energy supply, especially in early lactation.
Protein Metabolism	Amino acids (the building blocks for proteins) support gluconeogenesis, milk protein synthesis and metabolic adaptation, and some can be used as energy sources..
Leptin	Leptin reflects energy reserves, appetite regulation, body weight and metabolic status.
Choline	Choline supports liver fat export and methyl metabolism*, both central to energy handling, especially during transition.
Cobalamin (Vitamin B12)	Cobalamin supports propionate metabolism and energy production.
Biotin (Vitamin B7)	Biotin acts as a cofactor in carboxylation reactions linked to energy metabolism.
Riboflavin (Vitamin B2)	Riboflavin is required for oxidation-reduction reactions in energy metabolism.
Folate (Vitamin B9)	Folate supports methyl metabolism*.
Methionine	Methionine supports methyl metabolism*, liver function and milk protein synthesis.
Lysine	Lysine is a key amino acid for milk protein synthesis and protein efficiency.
Tryptophan	Tryptophan is involved in amino acid metabolism, inflammation, liver function and energy partitioning.
Glutamine	Glutamine supports nitrogen transfer, gut tissue, immune cells and metabolic adaptation.
Magnesium	Magnesium is required for many ATP-dependent reactions and energy metabolism.

Biological process about…	How is it connected?
Phosphorus	Phosphorus is a structural component of ATP and is therefore fundamental to cellular energy transfer. Marked phosphorus insufficiency can reduce appetite and performance.
Calcium	Calcium signalling, muscle function, feed intake and gastrointestinal motility affect the cow's ability to consume and use energy, especially during transition.
Iron	Iron supports oxygen transport and mitochondrial energy metabolism.
Cholesterol Metabolism	Cholesterol links liver metabolism, membranes, steroid hormones and lipid transport.
Alpha Linolenic Acid	Alpha-linolenic acid contributes to fatty acid metabolism and inflammatory balance.
Linoleic Acid	Linoleic acid contributes to fatty acid metabolism, cell membranes and milk fat profile.
Heat Stress	Heat stress suppresses intake while increasing maintenance and thermoregulatory costs, altering glucose and lipid metabolism and reducing energy available for production.
Metabolic Stress	Metabolic stress is directly characterised by negative energy balance, increased NEFA (non-esterified fatty acids) and BHB (beta-hydroxybutyrate),, altered glucose metabolism and hepatic lipid accumulation.
Heavy Metals	Toxic-element exposure may reduce intake and damage liver or kidney function, creating secondary impairment of nutrient utilisation and energy metabolism.
Mycotoxins	Mycotoxins can reduce intake and digestibility and may alter insulin sensitivity, liver function and energy metabolism.

Energy Metabolism - Guidelines for veterinarians and nutritionists

Check first:

- dry matter intake (DMI) of lactating and dry cows: Monitor kg DM/cow/day by group and compare intake with milk production level, stage of lactation, and the target set in the feeding plan
- feed availability and appetite of fresh cows: ensure that feed is continuously available and that freshly calved cows start eating promptly after calving. Offer water and an energy drink immediately after calving, as much as they can drink

- changes in body condition score (BCS) during lactation: pay particular attention to excessive loss of body condition in early lactation and excessive weight gain in late lactation
- incidence of ketosis: monitor clinical cases as well as possible cases of subclinical ketosis, particularly in fresh cows (aim for less than 10% subclinical ketosis and no clinical cases)
- BHB and NEFA results: use them when available to assess the degree of negative energy balance and mobilisation of body fat
- milk production in relation to feed intake: assess whether dry matter intake is adequate for the level of milk production (expect at least 1.5 kg of milk from each kg of dry matter consumed), and whether changes in milk production occur before or at the same time as changes in feed intake
- manure assessment: assess manure consistency, the amount of undigested grain or fibre, and, if necessary, wash manure through a sieve to assess particle content
- success of the transition period: evaluate feed intake, changes in body condition, post-calving diseases, and the onset of milk production as a whole, together with your veterinarian and nutritionist
- heat load and environmental/toxin exposure: assess these particularly when there is no other clear explanation for poor feed intake, increased liver load, or a decline in production

Nutrition focus:

- increase effective energy intake, not only formulated energy
- check starch level and starch digestibility
- secure effective fibre and rumen stability
- review metabolisable protein, methionine, lysine and total amino acid balance
- consider rumen-protected choline in transition and early lactation
- review vitamin B support when relevant signals suggest supplementation may be helpful
- review calcium, phosphorus and magnesium as part of the complete mineral programme
- check iron status where intake, antagonists or inflammation may affect functional availability
- support liver function if ketosis, high fat mobilisation or poor fresh-cow recovery is present
- control heat stress and investigate toxic feed/environmental exposure where metabolic strain persists

Be bold: It's not just a question of whether the feed meets the recommendations, but whether the cow is actually able to eat, absorb and use enough energy! This is typically one of the biggest things that needs to be adjusted. We're here to help – don't hesitate to contact your customer service representative for additional vet and nutritionist consultation!

5. Fat Metabolism

Signals related to fat metabolism suggest that fat mobilisation, transport, oxidation, or secretion are not functioning optimally.

Biological process about...	How is it connected?
Cholesterol Metabolism	Cholesterol production reflects lipid transport, liver function and availability as a substrate for steroid hormones.
Alpha Linolenic Acid	An essential omega-3 fatty acid linked to milk fat, membranes and inflammatory balance.
Linoleic Acid	An essential omega-6 fatty acid linked to milk fat, membranes and immune signalling.
Choline	Choline supports very-low-density-lipoprotein (VLDL) formation and liver fat export.
Leptin	Leptin is related to fat reserves, appetite, body weight, energy status and fat mobilisation.
Vitamin A	Vitamin A is fat-soluble and linked to epithelial function, reproduction, immunity and body stores.
Vitamin D	Vitamin D is fat-soluble and related to calcium metabolism, immunity and metabolic regulation.
Vitamin E	Vitamin E protects lipids and cell membranes from oxidative degradation when fatty-acid mobilisation and oxidation are increased.
Vitamin K	Vitamin K is fat-soluble and essential for normal blood clotting. It also contributes to bone and calcium metabolism.
Mammary Gland	Mammary tissue makes and secretes milk fat.
Carbohydrate Metabolism	Rumen carbohydrate fermentation provides acetate and butyrate, which are major precursors for milk fat production.
Calcium	Calcium is required for milk secretion and normal neuromuscular function; hypocalcaemia can reduce intake and indirectly intensify postpartum fat mobilisation.
Heat Stress	Heat stress alters lipid mobilisation and mammary metabolism. It can also change milk fat synthesis and composition.
Metabolic Stress	NEFA (non-esterified fatty acids) release, hepatic lipid accumulation, ketosis and impaired liver fat export are core features of metabolic stress.

Biological process about…	How is it connected?
Mycotoxins	Some mycotoxins can impair liver and mammary-cell function as well as alter biological processes involved in milk-fat production.

Fat Metabolism - Guidelines for veterinarians and nutritionists

Check first:

- body condition score (BCS) of dry cows and cows approaching calving
- loss of body condition score after calving — a loss of approximately 0.5 BCS points is considered acceptable
- incidence and risk of ketosis and displaced abomasum
- milk fat content and fat-to-protein ratio (target fat-to-protein ratio approximately 1.2-1.3)
- dry matter intake of fresh cows
- dietary fat sources and the amount of unsaturated fatty acids
- heat stress
- potential feed-related toxin exposure, if there is no clear cause for abnormalities in milk fat content or liver function

Nutrition focus:

- do not increase the fat content of the diet until liver function and the rumen's ability to handle the diet have been assessed
- avoid excessive body condition gain in dry cows
- maximise dry matter intake (DMI) in fresh cows
- assess the need for rumen-protected choline; research-based recommendations suggest 13 grams of active choline per cow per day, from 21 days before calving through day 21 of lactation
- assess whether methionine supply is adequate
- check the total fat content of the diet and the amount of unsaturated fatty acids
- support rumen fibre digestion by ensuring adequate energy and a sufficiently slow passage rate
- keep the energy density of the dry-cow diet under control while maximising dry matter intake. For larger breeds, the target is a minimum of 14 kg dry matter/cow/day. The higher the expected production level, the more important adequate intake during the dry period is
- consider the relationship between fat-soluble vitamin intake and liver function
- reduce heat stress
- investigate possible mycotoxin exposure if abnormalities in liver or mammary-gland fat metabolism persist (cows failing to increase milk production, ketosis, elevated somatic cell counts, etc)

Be bold: The strong mobilisation of fat stores puts a strain on the liver and increases the importance of methyl group donors such as choline and methionine, as well as antioxidant protection. If issues about fat metabolism are flagged in the EpiHerd report, the problem is not necessarily that the feed is too low in fat. Instead, the cow may be mobilising too much fat from its tissues or the liver may not have enough ability to process and transport fat. We're here to help – don't hesitate to contact your customer service representative for additional vet and nutritionist consultation!

6. Environmental and Toxic Exposures

Environmental and toxic exposure signals mean that the herd may be responding to a harmful external stress rather than to a primary nutritional deficiency.

Biological process about…	**How is it connected?**
Heavy Metals	Lead, cadmium and arsenic can enter the herd through contaminated water, soil, forage, feed, old paint, batteries, industrial waste or contaminated farm areas. Effects depend on the exact element, the chemical form, dose and duration. If such exposure is suspected, it is extremely important to identify the source of the exposure, including carrying out any laboratory analyses considered necessary in consultation with relevant experts.
Mycotoxins	Mycotoxins are harmful compounds produced by moulds that can occur in silage, grains, concentrates and other stored feed. For example, *Aspergillus* species can produce aflatoxins and *Fusarium* species can produce deoxynivalenol (DON), fumonisins and zearalenone (ZEN). The effects of mycotoxins depend on the toxin, the amount and duration of exposure, concurrent exposure to other toxins, rumen degradation, as well as the stage of production, dry matter intake, and health status of the cow. Mycotoxins can affect the gastrointestinal tract, liver, metabolism, immune defense, reproductive system and mammary gland. Symptoms and signs are often non-specific, which can make it difficult to identify mycotoxin exposure based on clinical signs alone.
Heat Stress	Environmental heat stress affects thermoregulation, water and electrolyte needs, feeding, rumen function, immunity, reproduction, and the mammary gland.

Environmental and Toxic Exposures - Guidelines for veterinarians and nutritionists

Check first:

- sources and quality of drinking water, particularly following floods, construction or excavation work, or changes to the water supply system
- forage, concentrates, the TMR (total mixed ration), and feed storage and preservation conditions
- heating of silage, visible mould growth, aerobic spoilage, and practices related to feed distribution and removal of uneaten feed (refusal management)
- old paint surfaces, batteries and accumulators, as well as workshop, machinery, and storage areas
- soil, ash, waste storage areas, and any potential runoff from industrial areas or stormwater
- unexplained herd-level changes in feed intake, milk production, reproductive performance, neurological signs, liver or kidney values, skin or coat condition, and recurrent illness

Nutrition focus:

- take representative feed and water samples for laboratory testing when contamination is suspected
- tailor mycotoxin analysis based on feed type, storage conditions and likely mold or fungal risk
- remove or replace contaminated feed while correcting risk factors related to moisture, heating, storage and feed distribution
- if a binder or other product intended for mycotoxin control is used, select the product based on the identified or probable toxins and assess possible mineral binding!
- check old paint surfaces, batteries, machine and workshop waste, chemicals, contaminated soil and ash and prevent animals from accessing risk areas
- use blood, urine, milk, liver, kidney or other suitable samples to examine toxic elements or other exposures at the discretion of the veterinarian
- treat suspected aflatoxin contamination as an emergency, as aflatoxin B1 can be metabolised to aflatoxin M1 and excreted in milk
- manage heat stress as soon as you can: provide shade, effective ventilation, fans, misting or sprinkling and continuous free access to clean and cool drinking water; ensure sufficient drinking capacity (12-14 cm/cow free edge of the trough in each compartment!)
- assess sodium, potassium, magnesium and calcium intake during heat stress, taking into account the total feed ration and the mineral content of the drinking water
- comply with applicable feed and food legislation and veterinary instructions on sampling, withdrawal periods, restrictions on the use of feed or milk, disposal and possible reporting obligations

Be bold: do not try to supplement your way out of an exposure problem. When toxic or environmental exposure is suspected, identify and remove the source first, otherwise, even a balanced diet will not compensate for continuous toxin exposure or significant heat stress.

Footnote:

* Methyl metabolism

Methyl metabolism is the cow's system for moving small chemical units (called "methyl groups") that are needed for energy use, liver function, milk production, cell repair, and immune defence. It is especially important around calving, when the liver has to handle large amounts of mobilised fat. Nutrients such as methionine, choline, folate, and vitamin B12 support this process and help the cow adapt to early lactation.