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Identify anti-nutritional factors

Anti-nutritional factors (ANFs), also referred to as *antinutrients*, *antinutritive factors*, *secondary substances* or *plant secondary metabolites*, are constituents which may be used either by themselves or through their metabolic products.

They interfere with feed utilisation and affect the health and production of animals.

Anti-nutritional factors may produce several adverse effects: reduce *nutrient intake*, *digestibility*, *nutrient absorption* etc.. **Low level of anti-nutritional factors in any animal feed are recommended** and high levels of this factors are forbidden.

Identified problems

The main challenges in animal production, especially for ruminants, are: *reduce feed costs*, *improve products quality* and *increase production*. In order to achieve this, **farmers are encouraged to exploit the use of unconventional feedstuff, browse foliage and shrubs**. However the problem of feeding such materials is the fact that they contain different **anti-nutritional factors** with different concentrations that **cause detrimental effects to animals**.

Why do plants feedstuffs contain anti-nutritional factors?

Anti-nutritional factors serves as defense mechanisms in plants.

Plants also produce and use antinutritional factors for plant to plant interaction, to fight their enemies and to interact with the external environment. **Plants produce and use antinutrients as natural pesticides:** to protect themselves against *moulds, bacteria's, birds and other insects* that plays on them. Just to cite some examples: *bitter taste, unattractive colours, poisonous, bad odor and immune suppressants.*

✘ **Detrimental and beneficial effects of Antinutrients**

Anti-nutritional factors can cause unpredictable effects on animals. Such effects can either be **POSITIVE:**

- reduce parasite burden
- reduce protein degradation in the rumen
- reduce methane emission
- reduce bloating in animals

or **NEGATIVE:**

- reduce feed intake,
- lower feed conversion
- bind to protein and other important nutrients needed by animals in the feed
- can also cause death in some cases.

Depending on the level of concentration of antinutrients in a particular feed. They interfere with the use of dietary nutrients in different ways, including:

1. Reducing nutrient digestibility by binding them.
2. Damage the animal digestive tract.
3. Reduce the digestive efficiency.
4. Can cause depression in animal growth and feed efficiency.
5. Affect animal health and performance.

Most common anti-nutritional factors in plant feedstuffs

The following deleterious Anti-nutritional factors are often tested through **[laboratory analysis](#) of animal feedstuffs and forages used in feeding livestock**. However the list can be endless depending on the interest of individual as feed safety is concerned in many countries.

The common antinutritional factors in animal feedstuff and forages are:

- Saponins
- Tannins
- Protease inhibitors
- Alkaloids
- Non protein amino acids (*mimosine*)
- Lectins (*phytohaemagglutinins*)

- Trypsin inhibitors
- Phytic acid
- Oxalates
- Amylase inhibitors

Understanding anti-nutritional factors in animal feeds

- Cyanogenic glycosides
- Aflatoxins and Gossypol.

Methods to counteract and reduce anti-nutritional factors in animal feed.

Applying appropriate techniques or effective processes or combinations of techniques could help to reduce or eliminate adverse effects of Anti-nutritional factors. Common and cheap techniques aimed at counteracting or reducing Anti-nutritional factors in feedstuff include: the *use of polythene glycol (PEG)*, *drying of feedstuff*, the *use of wood ash*, *solid state fermentation technique* and the *use of activated charcoal (Biochar)*, etc. However **every technique has its own consequences or implications** such as cost, labour and effects on important nutrients in the feed needed by animals in the feed.

A better understanding and management of Anti-nutritional factors is necessary to let farmers be able to apply more appropriate techniques to reduce antinutrients deleterious effects while enhancing their benefits and hence enabling the use of vast reservoirs of animal feedstuff.