

## **ANIMAL WELFARE IN ORGANIC FARMING OF CATTLE**

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### **Abstract**

*Most diseases that affect organic beef farms can be prevented with proper management and adequate sanitation. Disease prevention can be achieved by following a series of guidelines which make up the foundation pillars of organic production. The selection of native breeds is one of the most important factors, given that they adapt well to the environment. These are strong, rustic and more resistant animals. They are accustomed to the temperatures of the area, finding foodstuffs, altitude, weather conditions, etc. They are capable of transforming low quality foodstuffs into good flavour meat and have high reproduction rates. The animals' diet, based on natural resources and high quality organic formula feeds and forages, ensures a good nutritional state, a strong immune system and makes them more resistant to the onset of diseases. The treatment received by the animals, combined with the density of herds on pastureland, reduces the onset of pathological processes. When these points are kept in mind, sanitation problems on the farm are significantly reduced. Even so, there may be the odd case of an animal falling ill; it should be treated as soon as possible to prevent deterioration and endangering its life.*

Keywords: animal welfare, organic farming, alternative treatments, homeopathy, phytotherapy, aromatherapy.

### **1. INTRODUCTION**

In the organic agriculture it is the objective to keep the livestock healthy instead to treat the diseases. Here are to help animal-appropriated living conditions, appropriate performance requirements and a suitable genetic disposition including the fitness of the animals. The preventive and/or routinely application of veterinary medicines (so far not officially required), hormonal treatments, synthetic feed additives (except vitamins) or mast aids are forbidden. Inoculations are permitted. Also deworming medicines can be used, as far as analyses of faecal samples let a treatment appear necessary.

If an animal becomes nevertheless ill, are to begin first naturopathic treatments (homeopathy, phytotherapy etc.). If these do not show the veterinary required effect, other veterinary medicines can be applied also in organic agriculture, if they are prescribed by the veterinary. Their application is however subjected to strict regulations. So there are to be kept double waiting periods (at least 48 hours).

If an animal is treated more than three times per year with chemical-synthetically allopathic veterinary medicines, the products may not be marketed any more as organic products. All data of the livestock health as well as the application of medicines are to be noted in a stable book and submitted to the operational control.

Animal health is to be guaranteed mainly by preventing measures.

### **2. MATERIAL AND METHODS**

The disease prevention is based on the following principles in the context of the organic livestock production:

- Choice of suitable races or lines
- Keeping practise appropriate to animal species
- Feeding with high-quality forage

- Appropriate stocking density.

In the case of disease or injury of an animal, it must be treated immediately. Phytotherapeutic and homoeopathic products as well as trace elements should be preferred to chemical-synthetic allopathic animal medication or antibiotics. In order to avoid suffering or agonies of the animal, chemical-synthetic allopathic animal medication or antibiotics may be given if a veterinary takes the responsibility.

The preventive application of chemical-synthetic allopathic animal medication or of antibiotics is forbidden. Likewise, the use of hormones or similar substances for the control of reproduction (e.g. oestrus synchronisation) or for other purposes is not allowed.



**Fig. 1 Cattle on pasture**  
**Source: Project „EcoLearning”**

When using animal medication, the kind of means, the details of the diagnosis, the dosage, the kind of the application, the duration of the treatment and the legal waiting period must be indicated exactly. The data must be communicated to the board of control before the marketing of the animals or respective products. The treated animals are to be marked clearly. The waiting period must be twice as long as the legally prescribed

time; if no waiting period is indicated; it must amount to 48 hours.

The livestock handling has to take place with alternative procedures (homeopathic, phytotherapy) if possible. The veterinary must be informed in time about the restrictions of the livestock handling.

According to the EU Organic Regulation, the animals may be treated with allopathic measures not more than three times. If this measure is exceeded, the animal concerned must not be marketed any longer as organic produce; conversion time starts afresh for the animal. Treatments of all kinds are to be registered in the stock book.

Generally, the animals may be treated with conventional measures only therapeutically, according to the veterinary diagnosis and not preventively. The waiting periods are generally to be doubled.

Within the range of udder health and fertility the most frequent problems are in organic dairy cow husbandry. Usually, high performances do not lead inevitably to diseased cows, but to high requirements on feeding, keeping and technology. Since the cattle are digesting animals, feeding plays a central role regarding health and disease.

Therefore, feeding errors, contaminated forage, moulded hay etc. represent a frequent cause for various diseases.

Mastitis arises if a bad constitution of the animal and existing exciters hit each other.

Reasons for immune weaknesses of the cow have to be searched in the forage ration (ruminant appropriated and adapted to the lactation stage), the keeping conditions (little stress; close attention to hygiene) and the care of the animals.

Before antibiotics are employed, measures like milking out several times a day should be tried and causes should be simultaneously searched for. If nevertheless, the use of antibiotics should become necessary; a consistent and sufficiently high proportioned application of the treatment is indispensable for the success. Generally, the same success can be obtained with a competent homoeopathic treatment.

### **3. RESULTS AND DISCUSSIONS**

It is advisable to find out the cause of the illness as soon as possible, in order to:

- Avoid infecting the rest of the herd (and maintain the animal in isolation as much as possible).

- Resolve the deficiencies responsible for the problem.

If the treatment using the previously mentioned products is not effective, and the farm vet considers it opportune, antibiotics, allopathic or chemical synthesis drugs may be used on a once-off basis. The use of this type of drugs entails a double suppression period than that indicated on the prospectus for conventional cattle. The suppression period is the time during which, after a receiving a chemical treatment, no product obtained from the animal can be used for human consumption.

When chemical synthesis drugs are used on a farm, the vet must send a report to the corresponding supervisory body or authorisation containing the information on the type of drug, the cattle identification number (crotal) of the treated animal, the date of the administration of the drug, the dose, the reason for the use of the drug and the total suppression period. At the same time, the cattle farmer will have to keep a list of the animals treated and all the data contained in the vet's report.

All types of preventive treatments with chemical synthesis drugs are prohibited. In this respect, special attention should be paid to cattle foodstuffs, given that it is quite normal to find antibiotics in some conventional formula feeds to prevent the onset of diseases.

Artificial substances, such as antibiotics and hormones, used to prevent diseases, stimulate growth or induce the synchronization of heat periods, are also prohibited.

However, they are authorised for individual use and under vet's prescription for treating diseases in isolated cases.

When an animal presents concrete symptoms of disease and antibiotics are required, the responsible microorganisms may have created resistance and hinder the animal's successful recuperation. But more alarming are the consequences that this type of drugs have on the health of human beings and the environment. What is more, these substances are eliminated with faeces and remain accumulated in the soil for years (a large percentage of human tumours and human resistance to antibiotics are currently linked to food).

For organic farm animals to be sold as such, they should not have received more than three treatments per year, with the exception of vaccines, deworming/pest control treatments and official measures that are not included.

Systematic dehorning and tail cutting are prohibited. These can only be authorised by the competent supervisory body or authority in isolated cases based on management problems.

### **Alternative treatments in organic production**

#### **3.1. Homeopathy**

Homeopathy employs natural substances of animal, vegetable and mineral origin to treat health disorders. There are more than three thousand homeopathic remedies in existence that are obtained by means of successively agitating and diluting the base substances.

Hence, the concentration present in the end remedy is extremely small.

The homeopathic remedy acts on the immune system by stimulating the defence mechanisms, thereby making the animal react on its own account. However, antibiotics automatically destroy the germ responsible for the disease. They do not promote the formation of defences, which in fact are the ones impaired and, therefore, the germ colonises the organism.

In homeopathy, as in organic production, there is not a single common treatment for each disease. Sick animals or humans are not classified according to their disease.

Each patient is different because everyone has a unique way of manifesting the symptoms.

*For example*, let us analyse the case of two calves with diarrhoea. One's faeces are yellowish, liquid, jet out and are accompanied by pain (it kicks) and thrusts. We can also see that the calf is quite weak and that it gets better when lying down. The other calf's faeces are bloody and mucus-like, accompanied by thrusts and by the sensation that it never ends, worsening when laying down or with cold temperatures. It is not difficult to differentiate the symptoms; one just needs to pay close attention.

On conventional farms the same treatment would be given to both calves, based on antibiotics and anti-inflammatory drugs. However, in organic cattle farms different treatments would be administered because the diarrhoea is totally different. In the first case, *Podophyllum peltatum* could be given and, in the second, *Mercurius solubilis*.

Homeopathy does not produce miracles and it will not solve irreversible injuries or diseases requiring a surgical solution. However, they do help to reduce the effects of those injuries and enhance swift recovery after surgery.

The administration frequency varies a great deal from one homeopathic remedy to the next. In general, they can be grouped according to the process for which they are administered:

- When a treatment is administered for very acute and recently produced processes, such as a bee sting, an injury, a burn, etc., low dilutions of the remedies should be given at frequent intervals, spacing the doses out according to improvement.

- When treating acute processes, arising less suddenly, such as diarrhoea or pneumonia, low dilutions are also given 3 to 5 times a day.

- With chronic and prolonged processes, which with conventional medicine require medication for life, homeopathy produces very effective results. With chronic arthritis or dermatitis problems, it manages to cure or reduce the symptoms to the point of not requiring further medication. High dilutions are administered with a frequency ranging from once a day to once a week/month, depending on each case.

Homeopathic remedies are presented in several ways. They can be presented in granules, injections, creams, aerosols, etc. Granules are the most widely used and they can be dissolved in drinking water.

Although it may sound strange, in homeopathy the dose is not important. It is sufficient that the body receives, with relative frequency, (according to the case, as explained above) the stimuli to react and to enhance the immune system. The normal dose in adult beef cattle is 10 granules and 5 granules for young calves. There are no possible overdose problems because we are dealing with very diluted substances, hence no intoxication can occur.

For a homeopathic treatment to function, the most important factor is the adequate selection of the remedy and the dilution at which the remedy should be administered. Each remedy has many small

characteristics to be kept in mind, both in terms of symptoms and typical behaviour.

The following are some of the most widely used homeopathic remedies:

- *Apis mellifica*. It is extracted from the whole honeybee. We should recall the typical manifestations of a bee sting. A very rapid inflammation appears on the spot, which is red and itchy, and it is alleviated with cold presses. In view of these symptoms, it can also be applied on, among others, skin irritations such as sunburns, insect bites, allergies, etc.

- *Carbo vegetabilis*. It is the charcoal from non-resinous woods preferably obtained from the willow, birch or white poplar trees. It generates respiratory impairment accompanied by clumsiness, general weakness and wanting to lie down. It is indicated for respiratory impairment when the breathing frequency and depth are diminished. It has effective results on newborn calves.

- *Arsenicum album*. It comes from the arsenious anhydride. Under normal conditions, it is a very powerful toxic that generates a whole range of symptoms. With chronic intoxications, marked weakness with weight loss, tiredness, inflammation of parts of the digestive system, etc., have been observed. Therefore, highly diluted *Arsenicum album* can be used, among many other problems, for acute diarrhoea with ill-smelling and irritant faeces, accompanied by weight loss, tiredness and prolonged states of weakness.

- *Arnica montana*. This is a plant found in abundance on mountain meadows. When applied directly onto the skin, it produces pain in the muscles that appears after strains or as a result of injuries. It is indicated for all types of injuries and can be applied onto the skin or taken orally.

### **3.2. Phytotherapy**

It consists of the use of plants or natural derivatives to correct animal disorders. The active ingredients are substances that the plant has synthesised and stored during growth.

From a curative point of view, inside a single plant there can be a number of different active components. Among them, there is generally one that determines the application of each species in the pathological process, depending on whether there is a higher amount of that component or its activity is more powerful. The other components of the plant help towards that function.

The active components are not distributed throughout the plant in a uniform fashion, but they tend to be concentrated in flowers and leaves, although they can also be found in the roots.

A few *examples* of the most widely used plants are:

- *Avena sativa*. It holds vitamins of the B, K and E groups, as well as minerals, such as phosphorous, iron, cobalt and magnesium. It is indicated for nervous system disorders accompanied by lack of appetite.

- *Caléndula officinalis*. It holds essential oils as well as other substances that enhance wound healing. It is also used for cleaning skin infections or for calming pain in joints.

- *Eucalyptus*. The active ingredient is the essential oil found in the leaves. It is very useful for respiratory problems because it disinfects the channels and restricts mucus production.

- *Passiflora incarnata*. The common name for this plant is Passion Flower. It contains a sedative substance indicated for nervous disorders accompanied by insomnia or states of excitement.

- *Echinacea angustifolia*. Contains essential oil considered a potent antibacterial that combats infections. It increases immunity and it is also used for septicaemia produced after child labour.

- *Carduus marianus*. Commonly known as Milk Thistle, it has liver protection substances and tends to be recommended for liver disorders.

Homeopathy employs a large part of phytotherapy substances, but they cannot be classified as homeopathic remedies because they do not follow the basic laws of homeopathy (the ‘Similarity law’).

### 3.3. Aromatherapy

Each plant has a number of specific properties: to reduce inflammation, calm pain, disinfect, relax, etc. Aromatherapy is based on the use of plant essential oils. The ingredients of these oils are absorbed into the bloodstream, activating a series of chemical reactions to re-establish the balance in the body.

As in the case of the above therapies, the treatment is individualised based on the characteristics and sensations of each animal.

Some of the most widely used oils are:

- Pine: Obtained from the resin. Soothes muscular pain.

\* Rock salt is very easy to find and can be used as salt bags for animal foodstuffs.

Among the oligoelements (trace elements) authorised as additives in animal foodstuff are:

*Iron*: ferrous carbonate, ferrous sulphate, ferric oxide.

A deficit produces susceptibility to infections and anaemia.

*Iodine*: anhydrous calcium iodate, hexahydrate calcium iodate, sodium iodide. A deficit enhances the onset of goitre, infertility, skin and appendages changes.

*Cobalt*: cobaltous sulphate, basic cobaltous carbonate. A deficit generates anorexia, anaemia, infertility and susceptibility to diseases.

*Copper*: copper oxide, copper carbonate, copper sulphate. Deficiency symptoms are depigmentation of certain hair zones, cardiovascular and osseous disorders, diarrhoea, etc.

*Manganese*: manganous carbonate, manganous oxide. When there is a deficit of this oligoelement, pain in the joints, reproductive disorders and difficulties in maintaining the standing position are produced.

*Zinc*: zinc carbonate, zinc oxide. A deficit generates anorexia, skin cracking and reproductive disorders.

*Molybdenum*: ammonium molybdate, sodium molybdate. A deficit generates loss of appetite, even though requirements may be extremely low.

*Selenium*: sodium selenate. A lack of it produces muscular degeneration, reproduction disorders and diarrhoeas.

- Lavender: Extracted from the flowers. It is used for disinfecting wounds and to reduce inflammation.

- Eucalyptus: The oil is obtained from the leaves. It is very useful as an insect repellent.

### 3.4. Oligoelements and authorised substances

Under this section a number of raw materials of mineral origin contained in point 3, section C, Annex II of Regulation 2092/91 are authorised, as well as specific oligoelements used on occasions as additives in animal foodstuffs which are contained in section D of the above mentioned annex of Regulation 2092/91).

**Table 1. The following raw materials are authorised (Source: Project „EcoLearning”)**

SUBSTANCE	BY-PRODUCTS	ITS DEFICIT PRODUCES
Sodium	Unrefined sea salt, rock salt*, sodium sulphate, sodium carbonate, etc.	Pica behaviour (depraved or abnormal appetite) (eats and licks everything: floor, urine and perspiration from other animals).
Potassium	Potassium chloride	Loss of appetite, muscular weakness, rigid walking.
Calcium	Calcium carbonate, shells of aquatic animals, calcium lactate, etc.	Weak bones, slow growth, limping, possible fractures, joints pain.
Phosphorous	Defluorinated dicalcium and monocalcium phosphate, monosodium phosphate, calcium-magnesium phosphate, etc.	Low growth, Pica behaviour, low fertility.
Magnesium	Magnesium sulphate, magnesium oxide, magnesium phosphate, etc.	Delayed growth, muscular rigidity, attacks with unconsciousness.
Sulphur	Sodium sulphate	Reduced growth and protein synthesis.

All these substances are, in most cases, used as mineral correctors in formula feeds to avoid deficiencies that generate bone fragility problems, limps, muscular problems, nervous symptoms, etc.

Under normal conditions, when animals eat enough pasture or grass hay, these oligoelements are automatically assimilated in the diet and it is not necessary to add them to formula feeds.

### Deworming/parasite control and cattle vaccination operations

In organic production, any type of treatment used as a preventive measure is prohibited.

Vaccinations and deworming/pest control treatments are only authorised by the supervisory body or authority in specific cases and after carrying out a study of the problem on each farm.

The number of treatments carried out each year is limited and the tendency will be to reduce them gradually. Hence, the best moment for carrying out the treatment has to be analysed in order to obtain the highest efficiency.

On another front, special attention should be paid to the transmission of diseases from animals to human beings (parasitooonosis) by establishing control systems based on the isolation of animals suspected of suffering from the disease, complementary test analyses, hygienic measures, such as the use of gloves, masks, etc.

### **Vaccination**

The supervisory body or authority will analyse each situation and all the aspects that may influence the spreading of the specific disease in the area. Cattle farmers must be aware of any problem involving the animals on the farm and find out the cause of the problem.

*For example*, in particular areas, authorisation for the 'blackleg' vaccine is frequently authorised. This disease generally progresses very fast (hyper-acute progress) and ends with the fulminating death of the animals without leaving any form of injury. In cases of slower progress of the disease (acute progress), animals suffer from limps due to muscular pain, bubbles can be felt in the space between the skin and the muscle and body temperature rises. If this vaccine were not authorised in these areas, organic cattle farming would not be possible, given that the number of deaths caused by this disease would be very high.

Vaccines of maximum effect and least harmful should be used. The use of vaccines created through genetic manipulation is not authorised.

The vaccination of very young calves is not recommended because they tend to have good defences due to the colostrum received from the mother.

### **Deworming/parasite control**

Parasitism is a type of relationship that is established between two beings, one of them, generally the smallest, is referred to as 'parasite', and the largest, 'host' (in this case, beef cattle). The parasite feeds from the host without the latter receiving anything in exchange.

When the presence of parasites is abundant, damages are produced in the animal's organism, accompanied by reduced productivity and the onset of lesions that can put the animal's life at risk.

The symptoms observed in animals with parasites are very different and depend on the type of parasite but, in general, they tend to develop diarrhoea and hair coat disorders.

The coat of an animal in good health has an intense shiny colour. When the animal is suffering from any type of deficiency or disorder, the hair looks matt, has dandruff, looks rough and the animal does not lick itself clean.

One of the simplest and most frequently used methods of diagnosing parasitism is the serial analysis of faeces. It is advisable to gather samples of faeces during different times of the year to observe the amount of parasites eliminated. A faeces analysis carried out a few days prior and a few days after deworming is very useful for verifying whether the deworming treatment administered is the most adequate.

Faeces should be collected immediately after depositing, or even directly from the animal's intestine, in a clean container.

Other parasite diagnosis methods are blood and skin analyses. The latter are carried out on skin parasitism that frequently produces scaling, itching, redness of the patch, hair loss, etc.

Should the death of the animal be produced, a complete inspection (autopsy) of all the tissue, organs and muscles should be carried out to determine the type of lesions produced by the parasite in question and to establish effective treatments against it.

Special attention should be paid to diarrhoeas caused by parasites in calves because they can coincide with another type of infection and lead to the calf's death within a few days.

Once a parasite has been diagnosed and the way it lives and feeds identified, the most adequate deworming/parasite control treatment will be administered.

Chemical synthesis deworming/parasite control substances may be used with the limitation that maximally reducing the number of treatments per year and animal entails.

Deworming/parasite control treatments should be of the most inoffensive type for the animal, with a high dose margin in order to avoid intoxication problems, easily administered, that leave minimal residues and that only act on the parasite.

It is unlikely that any of the deworming/parasite control substances currently on the market fulfil all the above characteristics.

Some products leave residues in faeces, such as derivatives of Ivermectin (pharmacological principle), which intoxicate the beetles responsible for disintegrating them and thus the residues are assimilated by the floor.

The oral administration of chemical products is very complicated because cows do not open their mouths and hide their heads, but they tend to be substances that leave few residues.

In terms of alternative treatments, very good results have been obtained with phytotherapy and the above-mentioned inconveniences are eliminated. Among others, absinth, garlic and thyme in the drinking water are used as deworming/parasite control treatments.

Parasitism control methods should be based on preventive measures. The objective is to try to achieve a harmonious situation between the parasite and the animal without hindering production rates. The total elimination of parasites is impossible because their habitat, as in the case of the animals', is the natural environment.

Among the measures to adopt in avoiding deworming/parasite control treatments, are:

- The use of pastures during periods of lower concentration of parasites, according to studies carried out on each farm.
- Avoid bogged areas that enhance the progress and maintenance of many parasite cycles.
- Attempt not to pasture the land parcels every year, leave some without use for a year, given that this considerably reduces the contamination of the pasture.
- Heifers and the youngest animals should pasture on the safest parcels of the farm.



**Fig. 2. Heifers and the youngest animals on pasture**  
**Source: Project „EcoLearning”**

Adult cattle develop certain resistance and acquire a better balance with the parasite, without being affected.

#### **4. CONCLUSIONS**

Medical assistance should deal mainly with prevention, based on the following principles:

- Careful, suitable selection of breed and lineage. What should be taken into account in this choice is the animals' capacity for adaptation to local conditions, their vitality and resistance to disease. Furthermore, they should be selected in order to avoid disease or specific health problems associated with certain breeds. Native breeds and lineage should be given preference.
- Application of animal production practices suited to the demands of each breed, promoting high resistance to disease and infection prevention.
- Balanced feeding using good quality foods, together with regular exercise and access to pasturage, with the aim of boosting animals' natural immunological defences.
- Suitable head count, thus avoiding over-population and possible animal health problems this can cause.

These principles should limit health problems so that they can be controlled, essentially through preventive measures.

The use of veterinary medication in organic farm should obey the following principles:

- Phytotherapeutic - for example, plant extracts (with the exception of antibiotics) and essences - and homeopathic products (for example, vegetable, animal or mineral substances) and oligoelements should be used in preference to allopathic veterinary medications of chemical synthesis, or antibiotics, as long as their therapeutic effects are adequate for the animal breed and problem that is being treated.
- If the above-mentioned products are not, or if there is a probability they will not be effective, in curing the disease or injury, and treatment is essential to avoid suffering, allopathic veterinary medications of chemical synthesis or antibiotics should be used in treatment without delay, if necessary in isolation conditions and in suitable installations, under the supervision of a veterinary doctor.

Allopathic veterinary medications of chemical synthesis and antibiotics may not be used as preventive applications.

The use of substances to stimulate growth or production is forbidden (including antibiotics and other artificial growth-enhancement substances), as is the use of hormones or similar substances to control ovulation (for example, oestrus inducement or synchronisation) or for any other purposes.

Nevertheless, hormones can be used as therapeutic veterinary treatment in a particular animal.

The safety interval between the last administration of an allopathic veterinary medicine to an animal in normal conditions and the production of food of organic origin from such an animal should be double that of what is stipulated normally, or 48 hours, if the period is not specified, thus assuring the integrity of organic farming to consumers.

With the exception of vaccines and antiparasitic treatments, as well as any obligatory eradication plans implemented by the EU Member States, if more than two (with a maximum of three) treatments with allopathic veterinary medicines of chemical synthesis and antibiotics are administered in the space of a year (or more than one treatment if the animal's productive life cycle is less than a year), the animals in question, or products derived from them, cannot be sold as conforming to organic production regulations. Such animals must be submitted to conversion periods established by the regulations, under previous agreement from the control authority or body.

It is forbidden to keep animals in conditions or under a feeding regime that can cause anemia.

Buildings, pens, equipment and utensils should be clean and adequately disinfected to avoid cross infection and the development of pathological organisms.

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