

Practical approaches to animal health issues on organic farms

A summary of a workshop attended by 15 delegates at the BCVA congress on 19th October 2018.

Abstract:

The workshop started with an overview of organic animal health standards and the organic market.

In the EU animal health standards promote “positive health” and preventive medicine, but treatments can be given without the animals losing their organic status. This is different in some other countries, especially the USA, and this is relevant when UK producers export produce. A misunderstanding of standards can lead to potential welfare problems, but correctly managed, organic standards promote high levels of welfare and health. Some examples of common health issues and their management within the organic system are given – mastitis, calf issues, Johne’s control, trace element deficiencies and parasite control.

Introduction - What is organic?

Organic Food is produced and consumed primarily for three reasons:

- Health, low residues, low degree of antimicrobial resistance
- Animal Welfare
- Biodiversity, environmental benefits

Evaluating the evidence for and against these areas was beyond this workshop, there was agreement that there is evidence in favour of biodiversity, some evidence of lower degree of antimicrobial resistance (e.g. less MRSA found in bulk milk samples of organic dairies in Germany, Tenhagen *et al.* 2018), but animal welfare highly depends on the individual farm.

There are potential conflicts of interest between these three aims, especially the ambitions of the highest possible degree of animal welfare against avoiding medicine usage and residues. This conflict is balanced in different ways in different parts of the world.

While biodiversity is favoured and there is evidence for a positive impact of organic farming on biodiversity, the overall environmental impact of organic and less intensive farming is in discussion, with low fertilizer and pesticide use being in its favour, but with low yields, higher land usage and methane emissions per unit of food produced being held against it. Weighing up these areas was beyond the workshop, but it is clear that with limiting resources any system has a moral obligation to be efficient – wastages, e.g. due to disease and poor fertility should be avoided, and vets are committed and in a unique position to help clients to achieve this.

To understand some of the developments in UK organic farming, especially dairy farming, some facts regarding the organic market were presented:

UK customers spend a comparatively small amount on organic food annually – 40 Euros per person, compared to 83 in France, 106 in Germany and 111 in the US. Furthermore, the organic world market is growing considerably faster than the UK organic market, from 2005 to 2015 at 146 % against 22 % in the UK, with the US organic dairy market tripling in this period (Figures taken from OMSCO 2017).

This makes looking for export markets an attractive proposition, but different standards may be a potential barrier as outlined below.

Organic Standards:

In the EU two regulations deal with organic standards, regulation 834/2007 and 889/2008. National governments and certification bodies implement these regulations, they can require stricter

standards (e.g. the requirement for a herd health plan in the UK), but cannot have lower standards.

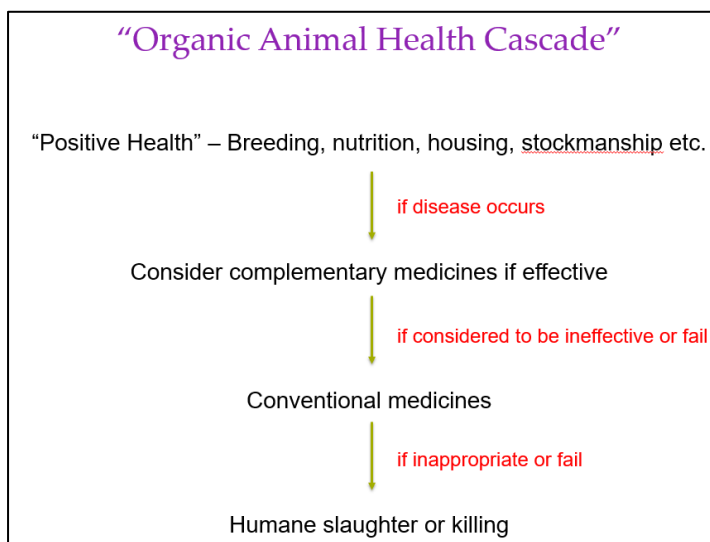
With regards to animal health and veterinary treatments:

“Organic stock farming should respect high animal welfare standards and meet animals' species-specific behavioural needs while animal-health management should be based on disease prevention. In this respect, particular attention should be paid to housing conditions, husbandry practices and stocking densities. Moreover, the choice of breeds should take account of their capacity to adapt to local conditions.”

“Disease shall be treated immediately to avoid suffering to the animal; chemically synthesised allopathic veterinary medicinal products including antibiotics may be used where necessary and under strict conditions, when the use of phytotherapeutic, homeopathic and other products is inappropriate. In particular restrictions with respect to courses of treatment and withdrawal periods shall be defined”.

Animal health management can be seen as a cascade system (Figure 1):

Figure 1



Homeopathy is mentioned, which caused considerable discussion in the group (see box 1). It should, however, be clear that no complementary medicine has to be given at all if this is considered ineffective, and misunderstandings of this point have led to welfare problems in the past.

What are the restrictions on animal medicines?

- Extended withdrawal periods (usually twice the statutory, although variable depending on certification body). The minimum withdrawal period is 48 hours for all conventional medicines, including anti-inflammatory and antiparasitic drugs but excluding vaccines and teat sealants.
- No prophylactic use of antibiotics
- Other preventive/strategic use only with prior permission from certification body (e.g. fly strike prevention, liver fluke treatment)
- A maximum number of treatment courses per year (excluding vaccines and antiparasitic treatment):
 - One in meat producing animals where the cycle is less than one year
 - Three in all other animals

Animal welfare is a priority – farms can lose their organic status if they withhold effective treatments and allow animals to suffer.

In the UK (but not according to the EU standards) all organic producers must draw up a health plan “preferably drawn up in consultation with a veterinary surgeon”. This gives veterinary surgeons a unique opportunity to address preventive measures in discussion with their organic clients (Hayton 2012a, Hayton 2012b). Other aspects of veterinary interventions are summarized in Table 1:

Table 1: Examples of banned and permitted practices:

Banned practice	Permitted practice
Prophylactic use of antibiotics including blanket antibiotic Dry Cow Therapy	Selective antibiotic dry cow therapy in animals with an indication of intramammary infection.
Heat synchronisation	Fertility treatment of individual animals
Embryo transfer	Artificial insemination including the use of sexed semen
Blanket worming	Worming after diagnosis or strategic in a known problem (e.g. liver fluke)
Genetically modified organisms, cloning, transgenic animals	Medicines derived from genetic modifications, e.g. vaccines

Other important aspects of organic livestock standards:

Feeding of ruminants:

- Access to pasture is mandatory during the grazing season whenever the weather conditions allow
- 60 % of dry matter on a daily basis has to come from forage. This can be reduced to 50 % for dairy cows up to three months into lactation
- All feed has to be organic; it can be in conversion if from the own holding
- No synthetic amino-acids and vitamins unless prescribed as medicine
- Milk feeding/minimum weaning age:
 - 3 months for calves
 - 45 days for lambs
 - 40 days for pigs

Routine surgical procedures

Dehorning, castrating and tail docking are not routinely allowed but can be authorised if necessary for hygiene, safety etc., e.g. tail docking to prevent fly strike and castration of calves for health and safety reasons.

There was a detailed discussion on pain relief in surgical procedures, and there is a deficit in licenced analgesics for sheep and goats. Representatives of a pharmaceutical company explained that the

cost of licencing is a prohibitive factor, but this is limiting the uptake of effective pain relief for these procedures. The problem of pain relief in lamb castrations is not limited to organic producers, but these will be expected by the consumers to apply higher welfare standards than conventional farmers or find alternatives to the procedure.

It was discussed that many practices which were limited to organic producers in the past have now become mainstream, examples are:

- Selective use of womers – SCOPS/COWS

- Selective/targeted dry cow therapy

- Prudent and restrictive use of antibiotics

- Maximising milk and meat from grazing and forage

How do organic veterinary standards differ in the USA, which covers 50 % of the organic world market?

While in the EU almost all veterinary medicines are allowed to be used subject to restrictions above to preserve and restore animal welfare, in the US all conventional medicines are banned with exceptions listed which include vaccines, minerals, xylazine, local anaesthetics, antiparasitic drugs for breeding animals, but not antibiotics or teat sealants. The list of permitted substances can be found under

<http://bit.ly/livestock-synthetics> (accessed 29/12/2018)

The standards state that animal welfare is a priority and treatments have to be given if necessary, but animals which have been treated with a prohibited substance and their products must never enter the organic market. For example, a six week old heifer calf being treated for pneumonia with an antibiotic will never produce organic milk in the US.

This reflects different cultures and different priorities in different countries (and therefore different definitions of what is considered to be organic) and becomes relevant for UK producers trying to export into the growing US market. So what is the current situation?

An equivalence agreement is in place, allowing UK organic dairy producers to export milk and milk products from cows which did not have any antibiotic treatment for the last 12 months. Within the

supply pool of the Organic Milk Suppliers Cooperative (Omsco) there is a group of farmers guaranteeing to supply milk from cows not been treated with antibiotics for the last 12 months. They receive an additional premium on top of the organic milk price. There are two main ways to produce/separate this milk:

- Farms with very low antibiotic usage could either use treated cows to feed calves on or cull or sell them (organic standards allow milk to be fed to calves after the end of the statutory withdrawal period)
- Farms having two herds or two groups, with separate milk tanks and separate collections

In the discussion there were concerns that these standards may in some circumstances discourage farmers to give necessary treatments, but this should not happen with the correct understanding.

The two group solution was seen as problematic as the main issue with antibiotic usage is the selection of resistant bacteria in the environment which potentially could affect both groups.

However, the targeting of a bigger, global market is the main reason why the extreme milk price fluctuations in the past 20 years appear to have come to an end – having a variety of potential outlets beyond the UK supermarkets has stabilised the organic milk price for all producers including those producing for the domestic market.

Approach to common health issues

Mastitis in dairy cows

There is common agreement that prevention is the key in mastitis control, and those measures are very similar for organic and non-organic dairies. The AHDB Dairy Mastitis Control Plan can be used as a gold standard for mastitis prevention, exploring all possible risk factors. It is widely agreed that effective mastitis management does not require high antibiotic usage, and cell counts can be comparable in organic herds (Haskell *et al.* 2009).

Selective/targeted dry cow therapy should be applied in the same way as for non-organic herds, with emphasis on reducing the need for antibiotic dry cow therapy. (See case 1).

Case 1: "I'm having a lot of cows to dry off soon, my bulk milk cell count is 300,000, but my organic inspector says I should use less antibiotics. So my plan is to change the threshold for targeted antibiotic dry cow therapy from 200,000 to 250,000. What is your opinion?"

The farmer's point is understandable – pressures from two sides and giving in to the highest pressure, but it is an artificial conflict – low cell counts AND low antimicrobial usage can be achieved. A record analysis and farm visit can pinpoint the cause of the cell count problem, and preventing new infections should be the main focus before culling and treating as measures to eliminate existing infections. As for the thresholds for antimicrobial treatment a rational approach should take the opposite direction – the concept of the positive predictive value means that a borderline cell count cow is more likely to be infected in a herd with a higher bulk milk somatic cell count (which usually means a higher prevalence of infected animals), therefore the threshold should be lowered, as outlined by Biggs *et al.* (2016).

Clinical mastitis should be treated in the same way as in non-organic herds, and there is no disincentive against the use of anti-inflammatory drugs. They count as part of the same course as antibiotics, so will not count as an additional "strike". The extended withdrawal periods have to be observed. This makes new approaches like on-farm culture and selective treatment potentially attractive for organic producers (e.g. (Lago *et al.* 2011)). With mild or moderate cases caused by gram negative bacteria and "no-growths" having high spontaneous cure rates there is evidence that treating Gram positive cases only can significantly reduce antibiotic usage on many farms without affecting mastitis outcomes. While on a pure economic level this approach may not be cost-effective on many non-organic farms (Down *et al.* 2017), the higher milk price and extended withdrawal periods on organic dairies change the economics.

Another way of reducing antimicrobial usage is at the other end of the spectrum – treating clinical cases in chronic high cell count cows with anti-inflammatory drugs only, as bacteriological cure rates are very low even with antibiotics. This approach has been proposed by Krömker and Leimbach (2017).

Calf issues

Calves have to be fed on whole organic milk for a minimum of 12 weeks. There is very limited availability of organic milk replacers, and they are very costly, so they should be reserved for farms with a serious Johne's problem. As organic milk is expensive (high opportunity cost of milk feeding calves), some farmers are restricting feeding. It is now widely accepted that this affects welfare and long term productivity of the animals – the extra milk is not a cost but an investment.

Treatments for diarrhoea and pneumonia are the same as for non-organic calves – while uncomplicated cases of diarrhoea do not require antibiotic treatment, those are justified as first line treatment in pneumonia. Where pneumonia was detected early using temperature sensitive ear tags, only 25 % of cases did not require secondary antibiotic treatment (Mahendran *et al.* 2017).

Another aspect of whole milk feeding is its low trace element content, especially of iron. Some older studies have shown that iron supplemented calves had a lower incidence of pneumonia and diarrhoea, compared to unsupplemented calves, and this is an area of ongoing research.

Separating cow and calf is an emotive issue, and some organic farmers wrongly believe they have to keep the cow with the calf for several days. Longer time with the cow has shown stronger reactions to separation by cow and calf (Flower and Weary 2001). Some smaller farms, however, have trialled late weaning including leaving calves with milkers, but that does not appear to be an option for most dairies.

Johne's control

The requirement of whole milk feeding for 12 weeks may increase the risk of Johne's disease if not managed carefully. However, several measures are available to mitigate/reduce this risk, e.g. :

- Pasteurization of milk and colostrum
- Regular testing with keeping positive cows out of the milk pool

Apart from reducing disease risk, pasteurisation of colostrum has also shown to improve the uptake of antibodies in calves (Gelsinger *et al.* 2014).

Case 2: "I'm on a Johne's testing programme for six years and have been pasteurising milk and colostrum for four years, and I still had eight high readings in my last test, why don't I get anywhere?"

While many farmers are aware of the role of milk and colostrum, the calving area has been identified as a bigger risk factor (Radia *et al.* 2013), which is still frequently overlooked.

It is important to remove calves out of the calving area as quickly as possible and to calve all cows which had a positive test separately. These areas are frequently neglected on many non-organic and organic farms.

Trace element deficiencies

While most non-organic dairy farms supplement trace elements to or above recommended levels, some organic concentrates are not routinely supplemented, and organic farmers rely more on forages. Therefore more trace element deficiencies may occur in organic or otherwise extensive herds, and monitoring the status using blood samples or cull cow liver samples (Kendall *et al.* 2015), depending on the trace element in question, is highly recommended.

Case 3: Long bone deformities in an organic spring calving suckler herd.

Several calves had slightly deformed legs at birth, a few had to be culled, but most of them recovered after needing additional help and nursing. The farmer suspects Schmallenberg. During the winter housing period the main forage is red clover silage.

A trace element profile in the dams was carried out, revealing low manganese levels.

Manganese deficiency has been described as a factor for long bone deformities and dwarfism. The diet and its ingredients may not be manganese deficient, but one or more factors in silage, especially in red clover appear to affect the utilisation of manganese (Hidioglou *et al.* 1990). If grass or red clover silage has to be fed, supplementing 1 g manganese per cow has been recommended in practice, otherwise, feeding hay instead will reduce the risk.

Another aspect is the lower iodine content of organic milk (Bath *et al.* 2012). Factors like under-supplementation and potential antagonists in some herbs may play a role, but as milk is (apart from fish) the main iodine source for people, this is currently being addressed by organic milk buyers who encourage to test and supplement as necessary.

Parasite control

Organic endoparasite control is almost identical with strict implementation of SCOPS and COWS principles. Quarantine treatments for bought in stock are allowed, but for liver fluke and sheep scab these may now be replaced by serological tests.

Other areas practiced by organic farmers are clean grazing strategies, genetic selection for worm resistance and resilience, nutrition, including protein feeding and the inclusion of certain herbs and legumes with antiparasitic properties (e.g. chicory and sainfoin).

However, where necessary strategic use of certain products can be permitted, mainly against fly strike and liver fluke. The Soil Association bans organophosphate dips as treatment for sheep scab, therefore, biosecurity is important. The only alternative treatment are injectable macrocyclic lactones – if given routinely this will select for resistant worms.

Box 1: Homeopathy and Organic Farming

Homeopathy and Organic Farming

Homeopathy is mentioned as one of the treatments which according to EU regulations and national standards “should be given in preference” ... if effective”. As mentioned above, organic standards do not prescribe the use of homeopathy, and the workshop agreed that there is no evidence to support its use. Doehring and Sundrum (2016) performed a literature review of over 4000 publications and came to the conclusion that homeopathy cannot be recommended in replacement of licenced interventions.

The RCVS advice is that “Homeopathy exists without a recognised body of evidence for its use. Furthermore, it is not based on sound scientific principles. In order to protect animal welfare, we regard such treatments as being complementary rather than alternative to treatments for which there is a recognised evidence base or which are based in sound scientific principles. It is vital to protect the welfare of animals committed to the care of the veterinary profession and the public’s confidence in the profession that any treatments not underpinned by a recognised evidence base or sound scientific principles do not delay or replace those that do” (RCVS 2017)

Conclusions:

Veterinary work in organic livestock production is well applied preventive medicine. The standards and practices generally promote health and welfare, but conflicts between different aims of organic farming may exist, and potential welfare issues are manageable within the organic context.

Keywords:

organic, veterinary standards, mastitis, calf health, Johne's control, trace elements, parasite control

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CPD questions:

1. Which of these countries has the lowest per capita spending on organic food?
 - a. USA
 - b. France
 - c. Germany
 - d. UK

2. True or false?
 - a. In the UK conventional medicines can only be given to organic livestock after alternative medicine has failed
 - b. In the US the withdrawal period on antibiotics is one year for organic livestock
 - c. In the UK the minimum withdrawal period for conventional medicine is 48 hours
 - d. In the UK a dairy cow treated more than three times within a year with conventional medicines (excluding vaccines and antiparasitic treatments) loses its organic status

3. Red clover silage in spring calving suckler cows has led to
 - a. Fertility issues in the next breeding season
 - b. Acute lameness
 - c. Long bone deformities in calves
 - d. Mastitis
 - e. Acidosis

4. Pasteurisation of colostrum

- a. Reduces the uptake of immunoglobulins by the calf
 - b. Increases the uptake of immunoglobulins by the calf
 - c. Is banned in organic farming as it is unnatural
 - d. Has no effect on the calf
5. In UK organic livestock antibiotics are (several answers may be correct)
- a. Allowed for treatment but not for prophylaxis
 - b. Allowed for selective dry cow therapy
 - c. Allowed for blanket dry cow therapy, as the amount is small
 - d. Allowed to treat clinical mastitis