Integration of livestock into organic farming systems: health and welfare problems

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1. The role of livestock in organic farming

The importance of livestock to the success of organic farming is often a source of major discussion. This discussion essentially revolves around whether grass/clover leys are seen as critical for generating nitrogen in the farm system or whether a truly stockless system based on green manures and grain legumes is possible. In the ley/arable system, livestock, particularly ruminant livestock, are certainly necessary for their role in utilising the leys, and are also important as a source of manure for transferring fertility to priority crops around the farm. Livestock also fulfill an additional role through their utilisation of arable crop residues.

This author takes the view that truly stockless systems are only likely to be agronomically reliable where soil type is very favourable, and that in most situations a system involving grassland and livestock is likely to be the most sustainable system of organic production. In any case, the climate, soil and topography in many parts of Europe are suitable only for grassland and livestock production.

2. Health and welfare in organic livestock systems

The maintenance of a high animal welfare status is enshrined as one of the principles of organic farming and good health is obviously a major element in the overall welfare status of the animal (IFOAM, 1998). Good livestock health is seen not simply as the absence of disease, but also as a high level of vigour and vitality, thus enhancing the animal’s ability to resist infection, parasitic attack, metabolic disorder, and recovery from injury.

The detailed organic standards operating in each country are aimed at ensuring that these health and welfare objectives are achieved in practice. Within the EU, national organic livestock standards are currently under review as a result of the publication of EU Regulation 1804/1999 on organic livestock production, which will come into operation throughout the EU on 24 August 2000 (CEC, 1999). It is within the context of this Regulation that this paper is presented. In terms of health and welfare, the major implication of this Regulation is its apparent inflexibility on the preventative use of veterinary medicines.

The maintenance of health and welfare status in organic livestock, whilst minimising veterinary treatments, requires a positive approach to livestock husbandry (e.g. Boehncke, 1997). In any decision the farmer makes e.g. on grassland management, on housing, on reproductive pattern, he should place the highest priority on the likely impact on livestock health. Whilst livestock systems vary enormously and it is difficult to generalise, some of the elements which have been suggested for inclusion in preventive health strategies are listed below:

* Self contained herds and flocks
* Appropriate choice of breed
* Breeding for disease/parasite resistance
* Suckling with mother
* Natural weaning
* Access to pasture during the growing season
* Adequate nutrition: high forage, limited cereal
* Regular monitoring of feed, physiology and health
e.g. silage, milk and urine, faecal worm egg counts
* Establishment of a clean grazing system e.g.
  Low stocking rates
  Alternating from year to year (sheep/cattle)
  Mixed grazing (sheep/cattle)
  Mixed age groups
  Use of hay/silage aftermaths
* If indoor accommodation is required:
  Adequate space allocation
  Good ventilation
  Adequate supply of dry bedding

However, no system is perfect and inevitably health problems do occur. The same range of disease and parasite problems occur in organic livestock as in conventional livestock. The main health concerns of organic farmers, at least in the UK, tend to be endoparasites and ectoparasites in young stock, and fertility and mastitis in dairy stock (Halliday et al., 1991; Roderick et al., 1996).

The relative importance of different health and welfare problems will vary enormously depending on the livestock species involved, climate, soil and land quality, the farming system itself (including the mix of enterprises and the farm infrastructure). They will also be influenced by non-physical factors such as the structure of the agricultural support system and the stockmanship skills of the farmer. These factors define the way in which livestock are integrated into the farming system, and directly influence animal health and welfare.

In the first part of the discussion below, I will define the farm situation which, in my view, provides the optimum context for organic animal health and welfare. Inevitably most situations will diverge from this ideal. The second part of the discussion focusses on these sub-optimal situations and, using some examples from my own experience, I will discuss how (and whether) the health and welfare objectives of organic livestock farming can be achieved in these situations.

3. The ideal situation: the mixed farm based on ley/arable rotations

In terms of optimising health and welfare, the ideal organic farm would have the following characteristics:

* Geographically located near to approved abattoirs and other market outlets, and to sources of feedstuffs and bedding materials, in order to minimise the stress and costs involved in transport.

* A mild climate and free draining soil, with good access to shelter, in order to permit outwintering of stock with minimum climatic stress and good underfoot conditions. However, relatively well ventilated grazing is required for summer grazing, to limit potential problems with flies.
A mix of grassland, cereal crops and a range of other arable crops including forages such as turnips or fodder beet. Such a system provides not just pasture for grazing and conserved herbage, but also cereals to supply concentrated energy, straw for bedding, and feed sources from other arable crops such as stubbles, arable bi-products, and alternative forage crops. The opportunity to utilise these arable forages in situ reduces disease pressure on the grassland from parasites such as stomach worms.

Grassland which is based on temporary leys rather than permanent grassland contributes to a clean grazing system by providing new, larva-free grass/clover reseeds on an annual basis. Leys also have advantages from an agronomic point of view, namely they facilitate the maintenance of a high clover content in swards, permit the exploitation by arable crops of soil fertility built up under the ley, and provide an opportunity for control of perennial grassland weeds such as docks.

All fields should be flat and suited for cutting for hay or silage as well as for grazing. This provides maximum flexibility in establishing a clean grazing system - steep or stony fields which cannot be cut can only be used for grazing (and must, therefore, be grazed continuously with the consequent risks of larval build-up on the herbage). Steeply sloping fields also increase the risk of prolapse in heavily pregnant ewes.

A mix of livestock species in order to dilute the disease challenge to susceptible stock. Generally, the worm species which affect one livestock species do not affect other species.

At pasture, a mix of different classes (age groups) of any one species, again to limit the build-up of worm challenge to susceptible young stock, although in housed animals mixed age groups should be avoided in order to minimise the risk of respiratory infections spreading.

A self-contained flock or herd in which animals are born, reared and finished on the farm, thus eliminating the stress caused by farm to farm transfer, preventing the introduction of new disease organisms onto the farm, and permitting the breeding of genotypes which are well adapted to, and resistant to, the disease organisms which are endemic on the unit.

Calving and lambing outdoors, at the start of the growing season in order to a) minimise risk of infectious disease from calving and lambing indoors, b) ensure that the pattern of maternal nutrient requirement is matched with the seasonal pattern of grass growth, c) minimise the risk from summer mastitis.

Good nutrition in terms of the balance of energy, protein and mineral supply and, in the case of ruminants, the supply of fibre to ensure efficient rumen function

Good livestock infrastructure, in terms of fencing, outdoor watering and feeding facilities, good handling facilities to minimise stress, well-designed winter accommodation, particularly in terms of ventilation, space, feeding facilities and ease of cleaning.

Trained and experienced stockmen with good powers of observation and the ability to care for livestock with the minimum of stress in terms of grouping, feeding and handling.

4. Negative influences on health and welfare in organic livestock

4.1 Impact of climate
Areas with a high rainfall and relative humidity are well suited to herbage production (and hence ruminant livestock production), but are not well suited to cereal production. The availability and cost of straw for bedding livestock then becomes an important factor in determining the type of livestock accommodation chosen. For example, the cost of straw in arable areas in the east of Scotland is approximately £30 per tonne, whereas the cost rises to £70 per tonne in the south-west of Scotland and in the Orkney islands.

The alternatives to loose housing in strawed courts are cubicle housing (usually for dairy cows, sometimes for suckler cows) and slatted floors (for young dairy animals and beef animals). Organic standards permit only a limited proportion of floor area to be slatted (50% in EU Regulation 1804/1999). A very high proportion of beef animals and dairy youngsters in the west of Scotland, the Orkney islands and in Northern Ireland are kept in totally slatted buildings. In the latter two regions the high rainfall is compounded by heavy soil types with poor drainage characteristics, so outwintering is not a practical proposition. Essentially, these farmers (approximately 65% of beef farmers in Orkney, 90% of beef farmers in Northern Ireland) are excluded from conversion because of the geographical location and climate of the farm, and would only be able to convert if major, and possibly very costly, changes to livestock accommodation can be made. Many farmers also house ewes on wooden slats or weldmesh floors for limited periods of time.

Many of these farmers would argue that animals housed on slats actually have a higher health and welfare status than animals kept in strawed courts, perhaps with an insufficient supply of costly straw. The national certifying authority in the UK (UKROFS) is currently reviewing the influence of slats on health and welfare. Of course, even if it were shown that slats had no adverse effect on health and welfare, high stocking rates are necessary for the system to function correctly. Such stocking rates would exceed those permitted under EU Regulation 1804/1999 and would only be acceptable if a larger solid-floored exercise area was available.

Many other farmers in these high rainfall regions, mainly on small farms, still house beef and dairy cows by tying in stalls. Again this is at least partly because of the high cost of straw bedding, and perhaps also because of lack of capital for investment in new accommodation. Tying in stalls obviously prevents complete freedom of movement by the animal and welfare is therefore compromised, but some farmers argue that cow welfare is actually improved because cows are protected from bullying by other cows. The negative aspects of stalls are mitigated if the animals are allowed access to pasture or exercise area for a part of each day, but this is not always possible in high rainfall areas in winter when soils are at field capacity.

4.2 Impact of land quality

One of the most difficult types of farming system in which to establish the concept of minimal prophylactic use of conventional veterinary medicines is the hill sheep system. Such farms may be very large, extending to several thousand hectares, but land quality is poor and the quality and potential production of the vegetation is poor. Such farms are characterised by large areas of natural vegetation and relatively small areas of productive land on which conserved forage can be made. The limited area of cuttable land restricts the opportunity to keep cattle (and hence of establishing an alternating sheep/cattle clean grazing system) and of providing worm-free aftermaths for grazing lambs. In terms of sheep grazing, two different forage resources can be identified: the open hill, and inbye land with better quality pastures.

On the open hill ewes with single lambs are normally stocked at low overall stocking rates (perhaps as low as four hectares per ewe in some situations). Stomach worms should not be a
problem in such circumstances (although the actual stocking rate may be higher because the animals may be concentrating on certain better parts of the grazing area and ignoring the rest). However, there may be major risk of infection with liver fluke (*Fasciola hepatica*). Other common problems in such situations are sheep scab (*Psoroptes ovis*) and, if there is tall, scrubby vegetation, ticks (*Ixodes ricinus*). It is difficult to see how a preventative management approach can be applied to such problems. It is simply not feasible to fence off every poorly drained pocket of land infested with the liver fluke snail. Likewise, double fencing is often suggested as a means of preventing contact with neighbouring sheep flocks, in order to prevent the spread of scab. This is not feasible on a 10000 hectare farm with a 40 km boundary.

Control of the tick problem may be possible through the implementation of a regular heather (*Calluna vulgaris*) burning programme, to keep the heather short and vigorous, but such a programme may be in conflict with other, environmental, objectives. At present, organic farmers in this situation, which is essentially very extensive, continue to use targeted prophylactic treatment where a known problem exists. Where such problems are known to be a threat, they must be dealt with prophylactically rather than therapeutically but such an approach would seem to contravene the requirements of EU Regulation 1804/1999, which appears to allow no flexibility in the preventative use of allopathic veterinary medicines.

The second forage resource on such farms, the improved grazing land, is normally reserved for lambing and, during the main growing season, for ewes with twins. If the farm is a sheep-only farm, it is impossible to create a clean grazing system on this grazing resource and worm infection of lambs (and therefore the need for anthelmintic) can be reliably predicted. Again, in order to minimise production losses and welfare problems, such treatment should be given before clinical symptoms are apparent but this would contravene Regulation 1804/1999. The options for dealing with these animals include restricting stocking rate, introducing a disease monitoring strategy (in this case regular faecal egg counts, as a means of predicting when worm populations are becoming dangerously high), and in the long term, basing the selection of ewe lamb replacements on their ability to resist worm infection - again by faecal egg counts.

Apart from the land quality itself, and the restrictive influence this has on the choice of farming system and hence on health and welfare, an additional factor often operates on such farms. These farms are often located considerable distances from markets and abattoirs, and from sources of purchased feedstuffs. This will certainly have a negative effect on health and welfare because of the stress involved in transporting animals, and the high cost of procuring feed may lead to sub-optimal nutritional status in animals.

### 4.3 Single-species specialisation in livestock systems

The hill sheep situation described above is just one example of a specialist livestock farm, in which only one livestock species is kept. It is clear that organic farming works most successfully where a diversity of livestock species and a diversity of crops are produced, for reasons related to livestock health, agronomy and environment. However, there are many situations where farmers are forced to specialise, e.g. because of small farm size and/or high cost of land, and converting to organic farming does not remove these constraints. There are examples of this in the dairy and pig sectors in the Netherlands and in Denmark. Whilst such specialisation may not create major health problems for the adult animals on these farms, young dairy stock, for example, are often obliged to graze the same pastures year after year, exposing these animals to risks from internal parasites. Cooperation between neighbouring farms specialising in different enterprises (e.g. pig and dairy farms, dairy and arable farms) may be one way of overcoming this problem.
4.4 Intra-species specialisation in livestock systems

A different form of specialisation - intra-species specialisation - is practised widely in the UK, as an element of the stratification system in the sheep and beef industries. Farms on marginal land produce store lambs and calves and normally are transferred to better land farms for finishing. Hill and upland farmers may be tempted to retain as many animals as possible for finishing on their own farm, in order to benefit from higher sale prices, but this puts more pressure on the forage resources of the farm and may have a knock-on effect on ewe condition, for example. Likewise, since young stock are the most susceptible to internal parasites and are the main source of rapid build-up, for example of worm larvae in pasture, the removal of these stock from the farm may be beneficial in terms of limiting such build-up of parasites in the farm environment.

On the other hand, the transfer process to other farms itself also has health and welfare implications. Such problems may increase in future, at least in the UK. As the supply of organic livestock increases, auction companies may become interested in mounting special organic sales and the passage of animals through auction markets will inevitable increase the risks from stress and disease transmission. A more desirable option from the health and welfare viewpoint would be the sale of these animals by electronic or video selling. In the conventional sector, however, such systems have thus far been limited mostly to the selling of finished animals rather than store animals.

4.5 Structure of EU agricultural support: the headage payment system

A major negative factor in the maintenance of health and welfare in organic livestock is the current system of EU support which rewards the farmer on the basis of the number of animals he keeps. In the UK at least, annual payments are made for each suckler cow, for each male beef animal, and for each ewe kept on the farm. In the UK, additional headage payments are made for livestock on farms with climatic or soil disadvantages (Less-Favoured Area farms). Under the Agenda 2000 changes, headage payments are also to be made for dairy cows and a slaughter premium will be payable on female as well as male beef animals. Certainly there are overall limits (quotas) to the number of claims which can be made on each farm, but the system clearly provides a major temptation to keep as many stock as possible within the quota, and mitigates against the use of lower stocking rates as a means of reducing parasite and disease pressure.

There are indications that the system may move away from headage payments towards area payments, on the basis of rewarding farmers for farming in an environmentally friendly way. This would suit the organic sector very well for a number of reasons including improved livestock health and welfare. However, it may be some years before major changes are implemented. At present, funding for the Agri-Environment Programme in Scotland only comprises about 4% of the total support for Scottish agriculture.

4.6 The human factor: stockmanship skills

The care of livestock requires good stockmanship skills, whether the animals are organic or conventional, but the organic stockman has a less comprehensive safety net available to him in terms of veterinary medicine use. It follows, therefore, that in the organic situation there is an even higher premium on the powers of observation, handling, feeding and treatment of animals. Such skills come naturally to some people, and for others they can be learned and developed over time with instruction, guidance and experience.
In converting to organic farming, the importance of such skills should not be taken lightly, but in practice there may be situations where insufficient importance is placed on them. Many individuals come into organic farming for ideological reasons, with little or no training and experience. This may not be of major consequence in the cropping sector, but is a serious matter if it impinges on animal welfare. It is ironic that the so-called ‘Farm Quality Assurance Schemes’ developed in the UK to reassure consumers about the methods of food production (in conventional agriculture) normally require stockmen to have undergone some training and assessment, whereas the organic standards stipulate no such requirement in stockmanship skills.

Even where the stockman is experienced, it may be that his experience will have been gained within the context of the conventional ‘fire brigade’ approach to health strategy, i.e. based on routine preventative use of veterinary medicines rather than preventative management. It is not unknown for farms to convert to organic livestock farming simply by withdrawing routine treatments overnight because this is what the standards suggest but without implementing the positive changes to management required to ensure health and welfare does not suffer. It is highly desirable that the stockman receives some training, not only in the technical approach required, but also in the attitudes and philosophies of organic livestock farming.

Technical challenges in organic farming are greatest in the early years, particularly the conversion years. In addition to appropriate training of stockmen, it is important that the farmer has a good relationship with his advisers including his veterinary practitioner, in order to minimise health and welfare problems during this phase. Because of the very rapid expansion of organic livestock farming in the UK at present, there is a lack of advisers and veterinarians with the necessary training and experience. A further difficulty is the fact that veterinary practitioners generally obtain their income from farmers by treating sick animals, rather than by providing advice on preventive health strategies. The veterinary profession needs to address this problem.

5. Conclusions

The current rapid expansion in organic livestock production across most of Europe, coupled with the recent publication of EU Regulation 1804/1999, make these very interesting times for the researchers, advisers and farmers who are involved in this sector. We face major challenges, none more so than the need to maintain the health and welfare status of organic livestock in this rapidly changing situation. The organic livestock standards are becoming exposed to an ever-widening range of different livestock systems, environments and individual farmers. As researchers and advisers we need to assess how and to what extent these widely differing systems can be adapted to the principles and standards of organic livestock production.

I have highlighted only a few of the areas of potential conflict between current practice and organic standards, which I recognise from my own experience. There will be many more examples from other parts of Europe, such as the difficulties posed by inheritance laws in some regions, leading to fragmented farms, small fields, problems for grazing management, and the consequent practice of permanent housing of stock. To what extent do we need to look for compromise and flexibility in the standards, and at what point is it necessary to draw the line and exclude some livestock systems? Should the majority of beef producers in Northern Ireland be penalised essentially because of their geographical location and climatic conditions? Should
EU Regulation 1804/1999 recognise that, even in some very extensive systems there may be health and welfare problems which require routine prophylactic treatment?

EU Regulation 1804/1999 seems unlikely to be modified to any significant extent, although there may be scope for some flexibility in its interpretation. Certainly it will be essential to maintain the integrity of the standards and the principles of organic farming. This will inevitably mean that some farmers will be penalised unless they are prepared to modify their systems, however unfair this may appear. What will also be required, however, is significant investment in research into preventative management approaches to the maintenance and enhancement of livestock health and welfare. Such techniques will benefit conventional livestock systems as well as organic systems. The establishment of the NAHWOA Concerted Action is extremely timely, therefore, and its role in leading and coordinating this discussion on a European basis is a vital one.

References


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