

## **MASTITIS THERAPY IN ORGANIC DAIRY HERDS**

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### **SUMMARY**

A total of 16 organic dairy farms were surveyed for 12 months and data were collected on prevention and treatment of clinical cases of mastitis. Comparative data from seven matched conventional farms were also collected. Organic regulations prevent organic dairy farmers from using antibiotic dry cow therapy, and milk withdrawal periods after antibiotic therapy during lactation are prolonged under organic regulations. It was assumed that alternative therapies would be more common in the organic herds. The main alternative to antibiotic therapy on the organic farms was homeopathy, which was the treatment of choice for clinical mastitis on 12 out of 16 farms. Homeopathy was used on 52% and topical udder liniments on 7% of clinical mastitis cases treated on organic farms. Treatment frequency of the alternative therapies differed little from that of routine antibiotic use, but the duration of treatment was on average longer when using alternatives to antibiotics. Milk withdrawal periods were on average shorter when using alternative therapies and were usually shorter than the treatment periods. Clinical mastitis incidence on the organic farms was similar to that recorded on conventional farms. Dry period mastitis was responsible for over 15% of all recorded mastitis cases on the organic farms.

### **INTRODUCTION**

Organic dairy farming in the UK has expanded in recent years. This is due to an improved marketing infrastructure and a favourable milk price compared to the conventional sector. In June 1998, there were 66 organic milk producers in the UK. An estimated 90 dairy farms were in conversion then (United Kingdom Register of Organic Food Standards [UKROFS], personal communication). Presently, new farms are entering conversion at a growing rate, induced by the introduction of higher conversion subsidies by the Government and sinking producer prices for conventional milk. Whilst the organic sector remains marginal in the British dairy scene, it has an important role in exploring alternatives to conventional practices.

Mastitis has been identified as one of the major concerns affecting potential converters to organic dairy production (Mark Measures of Organic Conversion Information Service; personal communication). Two surveys investigating animal health problems on existing organic farms also identified mastitis as a research priority for most organic dairy farmers (1,2).

The treatment and control of bovine mastitis on organic dairy farms differs from the practices on conventional farms mostly in the approach to dry cow therapy (DCT). A routine use of DCT is forbidden under the organic regulations (3). Clinical cases of mastitis can be treated by conventional antibiotic therapy, but prolonged withdrawal periods for milk discourage this practice.

A current MAFF-funded study, being conducted at the University of Reading, is determining mastitis levels and risk factors, treatment and control practices and economic implications of mastitis on 16

organic farms in the South of England and Wales. One aim of the study is to identify good practices and to develop advice for converting and established organic farmers. The results outlined in this paper are based on a preliminary analysis of mastitis treatment data collected during the first year of the two year field study.

## **METHODS**

Data were collected for 12 months from 16 organic (average herd size 100 cows) and seven matched conventional farms in South of England and in Wales. The data included farmer interviews on husbandry and management practices, environmental observations, farm mastitis data and data on treatment and milk withdrawal periods. National Milk Recording (NMR) data on production and milk composition and quality were also used. The farms were visited every three months to collect data and to interview the herdsmen during milking.

The data on mastitis treatments were mainly collected from on farm records. The organic dairy farms are obliged to keep detailed records of all animal treatments and milk and meat withdrawal periods. They often keep separate records for conventional and alternative treatments. All conventional farms, except one, kept mastitis treatment records at the beginning of the survey. Only minor adjustments were made to these records to serve the purposes of the survey.

The reliability of the treatment data was confirmed by interviewing the herdsmen during the regular farm visits and by checking the veterinary invoices for quantities of antibiotics used. The veterinarians, who had care of the animals on the farm, were also consulted and were given feed-back on the survey results regularly.

## **RESULTS**

A total of 960 cases of clinical mastitis were recorded on the 15 organic and seven conventional farms in 1997. Out of these cases, 615 (64.1%) were treated with antibiotics. All mastitis cases on the conventional farms were treated with antibiotics, whilst, on the organic study farms, antibiotics were used in only 40.7% of the cases (Table 1). More than half of the antibiotic treatments (55.7%) on organic farms were used on one farm alone.

Homeopathic treatments of clinical mastitis constituted 52.4% of all treatments on the organic farms. Other treatments, mainly with topical udder liniments, were used in 6.9% of mastitis cases in the organic herds.

**Table 1.** Treatment types for 960 clinical mastitis cases on 15 organic and 7 conventional farms in 1997

Type of treatment	Number of treatments (% of all treatments)
Antibiotic treatment on conventional farms	378 (100%)
Antibiotic treatment on organic farms	237 (40.7%)
Homeopathy on organic farms	305 (52.4%)
Other treatment on organic farms	40 (6.9%)

In three out of 15 organic herds, all clinical cases of mastitis were treated by non-antibiotic treatments (Table 2). On all but four of the organic farms, the majority of mastitis treatments were non-antibiotic. The treatment of choice for most organic producers was homeopathy. Nine out of 16 farms used homeopathy alone or combined with non-antibiotic support therapies (Table 3.). Further, three farms used homeopathy to treat a majority of mastitis cases but resorted to antibiotics regularly for various reasons. Two of the organic farms used antibiotics in a majority of cases but expressed interest in homeopathy. Two organic producers used antibiotics by choice in virtually all cases.

**Table 2.** Number and proportion of non-antibiotic treatments for clinical mastitis on 15 organic farms in 1997

Organic farm	Number of mastitis treatments	Number of non-antibiotic treatments	% of non-antibiotic treatments
1	56	56	100
2	34	34	100
3	14	14	100
4	129	128	99
5	37	36	97
6	43	39	91
7	7	6	86
8	36	30	83
9	62	49	79
10	83	52	63
11	18	11	61
12	19	5	26
13	7	2	29
14	33	2	6
15	131	2	2

**Table 3.** Treatment of choice for clinical mastitis on 16 organic farms

<b>Method of Treatment</b>	<b>No. of farms</b>
Antibiotics by choice	2
Antibiotics, but would like to learn homeopathy	2
Homeopathy with “lapses” to antibiotic use	3
Homeopathy with mastitis remedies and topical treatment	2
Homeopathy or cold water massage	1
Homeopathy by prescription	6

In the 378 cases on conventional and 237 on organic farms treated with antibiotics, 86.2% and 77.6% respectively (Table 4) were treated with intramammary antibiotics only. A combination of intramammary and injectable antibiotics was used in approximately 13% of the cases on both types of farms. Treatments with injectable antibiotics only and treatments by veterinarians were more common on organic than on conventional farms. The conventional farms used a higher number of intramammary tubes per treatment than did the organic farms.

**Table 4.** Types of antibiotic treatments of clinical mastitis cases on 15 organic and 7 conventional farms in 1997

	<b>Conventional Farms</b>	<b>Organic Farms</b>
Number of clinical cases treated with antibiotics	378	237
% of cases treated with intra mammary antibiotics only	86.2	77.6
% of cases treated with a combination of parenteral and intra mammary antibiotics	13.5	12.7
% of cases treated with parenteral antibiotics only	0.3	9.7
% of cases treated by a vet	0.5	2.5
Number of intra mammary tubes used/treatment	4.7	3.0

Duration and frequency of antibiotic treatments were similar on the organic and conventional farms (Table 5). Average duration of both homeopathic and other non-antibiotic treatments was, however, longer than that of antibiotic therapy. Maximum duration of up to three weeks of therapy was recorded. The average frequency of non-antibiotic therapy was slightly greater than that for antibiotic therapy. Some homeopathic therapies required very high frequencies of administration.

**Table 5.** Average duration and frequency of treatments for clinical mastitis cases on 15 organic and 7 conventional farms in 1997

Type of treatment	Average duration of treatment (days)	Average frequency of treatment (times/day)
Antibiotic treatment on conventional farms	2.9	1.7
Antibiotic treatment on organic farms	2.3	1.6
Homeopathy on organic farms	4.6 (max. 20)	2.3 (max. 12)
Other treatment on organic farms	5.4 (max. 14)	2.0 (max. 4)

There were differences in milk withdrawal times between the organic and conventional farms. The withdrawal times were much longer on organic farms, when antibiotics were used (Table 6). When homeopathic or other non-antibiotic treatments were used, the average withdrawal periods were shorter than the treatment periods.

**Table 6.** Average milk withdrawal times (milkings) during and following different clinical mastitis treatments on 15 organic and 7 conventional farms

Type of treatment	Average withdrawal time <u>including treatment</u> (milkings)	Average withdrawal time <u>after treatment</u> (milkings)
Antibiotic on conventional farms	10.4	4.7
Antibiotic on organic farms	17.5	12.9
Homeopathy on organic farms	6.6	0
Other on organic farms	6.0	0

Homeopathic nosodes (vaccines) in drinking water were used on 13 out of the 16 organic study farms, mainly during the housing period. DCT was used on two farms on targeted animals, under special permission from the UKROFS inspectorate, to attempt a cure for chronically infected udders. All conventional herds in the study used blanket DCT at drying-off.

A preliminary analysis of mastitis related data on the organic study farms during 1997 gave an incidence rate of 41 cow cases/100 cows, with 26% of the herd affected on average. The average recurrence rate

was 14%. Notably, 15.6% of all mastitis cases on the organic study farms occurred during the dry period, while the corresponding figure for the conventional study farms was 0.01%.

## **DISCUSSION**

There is a tendency among the organic dairy producers to move away from antibiotic use in the treatment of clinical mastitis. Whilst the organic regulations allow the treatment of sick animals with antibiotics, the prolonged withdrawal periods are an effective incentive to seek alternative therapies.

Homeopathy seems to be the most popular alternative. This is probably due to its resemblance to antibiotics with easy administration and medicine-like qualities. Provision of pre-prepared remedies for different disease entities by homeopathic pharmacies allows novel users to gain confidence with homeopathy rapidly. Preference for homeopathic therapy is, however, not restricted to organic farmers. The Ainsworth's Homeopathic Pharmacy has some 6,000 farming customers (Tony Pinkus, Ainsworths Homeopathic Pharmacy; personal communication).

Udder liniments, containing mint or anti-inflammatory agents, were used often as support therapy with homeopathy. On one of the organic farms, an anti-inflammatory udder liniment was often used as the treatment of choice.

There was very little adoption of other alternative therapies among the organic farmers. Cold water massage, frequent stripping and herbal remedies were only used occasionally as a support therapy for homeopathy. Many of these therapies were seen as time-consuming and unsuitable for the herring-bone parlour, where it is important to maintain a steady throughput of cows.

Parenteral antibiotic therapy and treatment of mastitis by the veterinarian was more common on the organic farms than on the conventional ones. This is probably a direct reflection of the unavailability of antibiotics on farms that do not use them routinely. It is difficult to draw any conclusions on the number of tubes used per treatment, as the present analysis does not take into consideration the type of tubes involved.

It was expected that the frequency of use would be higher when using alternative therapies than when using antibiotics. The most significant differences appear, however, in the duration of the therapies. Most alternative therapies do not offer recommended treatment regimes, and most herdsmen state that they treat until the symptoms disappear. The nature of supportive, "constitutional" treatment in homeopathy, which requires administration of remedies long after clinical symptoms of mastitis have disappeared, is another explanation to these long treatment periods.

As the alternative therapies do not have statutory milk withdrawal periods, it was expected that the withdrawal periods used on organic farms would be shorter than the statutory withdrawal periods following antibiotic treatments. Milk from cows in treatment is often included into the bulk tank while a "constitutional" homeopathic treatment is being continued.

Targeted DCT was used on a number of cows on two of the organic farms during the observation period. Organic farmer can apply for a special dispensation for the use of DCT, when the farm has a

recognized high SCC problem or is unable to cull cows with chronic infections. The latter was the case in 1997, when BSE cohorts were culled from most herds, leaving little scope for strategic culling. The allowance for the dispensation to use DCT on organic farms seems to be based on similar requirements as used in Sweden to choose cows for DCT (4).

The preliminary analysis of clinical mastitis incidence data from the study farms does not show any real difference between the organic and conventional study farms and a larger sample of conventional farms (5). Similar results on mastitis incidence in organic herds have been published in other studies in the UK (6) and in other European countries (7,8). The high incidence of dry period mastitis on the organic farms was an unexpected result. The uneven distribution of dry period mastitis among the farms suggests that some producers have found successful methods of drying-off without DCT, while others are still struggling to establish good practice. An in-depth study of the drying-off practices and dry cow management is being carried out during the second year of data collection. As available mastitis data from conventional farms does not always differentiate between lactation and dry period mastitis, it is difficult to make comparisons.

During the second year of data collection, the research project will focus on identifying “good practice” herds, calculating the cost of various mastitis control and treatment strategies and the impact of mastitis on organic dairy farms. Further analysis of dry period mastitis and drying-off practices will be conducted. An in-depth analysis of somatic cell count management on organic farms is also required.

As the survey was not designed as an efficacy study, it would be unwise to draw any conclusions on the efficacy of the various therapies used by the organic farmers. However, the preliminary analysis of mastitis levels and treatment practices on organic farms provides interesting data on udder health management without antibiotics and will hopefully be valuable in developing sound advice suitable for milk production under organic regulations.

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