USE OF HOMOEOPATHY AND NON-ANTIBIOTIC TREATMENT FOR MASTITIS IN SOMERSET

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SUMMARY

Results arising from the non-antibiotic and homoeopathic treatment of mastitis on two organic dairy farms in Somerset are presented.

One farm has a Guernsey herd, the other Holstein-Friesian cattle. Both farms finished their conversion to organic production in the summer of 1999. Each herd maintained between sixty-five and seventy cows over the period of study. The use of dry cow therapy ceased in the spring 1998 for the Guernseys and in the summer for the black and white herd.

In the Guernsey herd results were assessed on the basis of clinical signs, palpable udder health, milk appearance and non-recurrence of clinical cases, plus reference to the bulk milk somatic cell count. The herd is not NMR-recorded. Over the three-year period of study so far, the homoeopathic and non-antibiotic therapy resulted in a clinical cure rate of 70% from October 1999 to September 2000 and 55% from then until the end of August 2001.

In the Holstein-Friesian herd, National Milk Records data allowed the assessment of individual cow somatic cell count (ICSCC) following treatment. On the basis of the clinical signs and the consistent fall of ICSCC to below 250,000 cells/ml for more than two months after treatment, lower success rates of 55% and 53% were achieved over the two years of study since October 1999.

Results are also presented for treatment of high milk somatic cell count cows without antibiotics.

Reasons for the reduction in clinical cases over the period of study are discussed.

INTRODUCTION

The two dairies are adjoining units run under separate management, one with seventy Guernsey dairy cows plus followers, and the other with seventy Holstein-Friesian dairy cows plus followers. There is a substantial beef enterprise arising from the Channel Island herd, and a smaller one from the black and white herd. An organic cereal enterprise supplements both farms.
The farms commenced conversion to organic production early in 1997 and have been supplying the Organic Milk Cooperative with milk since the summer of 1999. Over the last two years both farms have been gradually converting their cows to spring calving. Approximately a quarter of each herd calved in the autumn of the year 2000, these have been served to calve in the spring of 2002 with the main portion of the herd. The use of whole-herd, dry cow antibiotic therapy ceased on both farms in the spring of 1998 although some individual cows have been treated in the Friesian-Holstein herd prior to their last lactation when their monthly somatic cell counts were consistently above 400,000 cells/ml.

This is an on-going study that has been undertaken because there is a need to assess whether alternatives to antibiotics and other chemotherapeutics have a role to play in the treatment of mastitis and other conditions affecting food-producing animals. The treatment of mastitis lends itself to assessment because as well as clinical judgement the measurement of somatic cell count provides a readily available parameter in measuring response to therapy.

The pan European Standards for organic agricultural production were revised and updated in August 2000 after a long consultation process, and provide a base for adoption by the United Kingdom Register of Organic Food Standards, and the certifying bodies such as the Soil Association and Organic Farmers and Growers. The Livestock Standards stipulate that:

‘Phytotherapeutic and homoeopathic products …… shall be used in preference to chemically synthesised allopathic veterinary medicinal products and antibiotics provided that their therapeutic effect is effective for the species of animal and the condition for which the treatment is intended.’

There is a requirement for the responsible use of antibiotics in food producing animals in order to protect their efficacy in human medicine. One has to question whether the widespread practice in the United Kingdom and some other countries of dispensing intramammary and dry cow therapy without total veterinary control over their use constitutes responsible use. In Scandinavian countries all mastitis treatment is undertaken by veterinarians (5). This is all the more pertinent given the fact that intramammary therapy alone, when used in licensed courses, is largely ineffective in the cure of mastitis in the lactating animal, certainly when the more pathogenic organisms are concerned. When used off-licence, over prolonged courses, surveys have shown that milk is often only discarded for the licensed period rather than the seven days legal requirement (2,3), and antibiotic residues are of great concern to the milk processing industry (4,1).

When using antibiotics to treat mastitis on these two farms I always use systemic therapy in combination with intramammary products, and always test the milk for antibiotic residues before offering waste milk to calves. Milk is not
sold for human consumption until organic standards have been satisfied. All practice clients have on-farm test kits and are encouraged to use them, and to use combination therapy or parenteral therapy alone in preference to tubes.

Discard of antibiotic-contaminated milk into the environment, usually via the slurry pit, results in contamination of the environment and risks the possible transfer of resistance to other types of bacteria through genetic transfer. Its use for feeding calves poses similar risks and is specifically forbidden by Organic Standards.

The prolonged withhold periods stipulated by Organic Standards when using chemotherapeutic medicines make milk losses as a result of treatment extremely expensive. For example, the treatment by injectable and intramammary therapy for a cow yielding thirty litres daily means that, under Soil Association rules with a fourteen day milk discard following treatment, a milk discard cost alone of over £140 is sustained. Against this are the potential lactation losses if the case is not treated effectively.

The difficulty in assessing phytotherapeutic products is that none are licensed by the Veterinary Medicines Directorate for internal or intramammary use in this country. Nevertheless, products derived from Aloe vera are being widely used on organic and conventional farms in the UK, with anecdotal evidence as to its reasonable efficacy in mild mastitis cases. Organic standards require a minimum two-day withdrawal period for phytotherapeutic products holding a nil legal withdrawal. It would be advantageous for the livestock industry if some of these potentially useful herbal products were properly assessed and licensed to ensure quality of production, concentration and use, including the stipulation of withdrawal periods.

Homeopathic medicines above a 6C potency are specifically excluded from having a withdrawal period under European licensing regulations because it can be shown that above this dilution there is no chemical trace of the original substance remaining, and hence residues do not occur in treated animals.

Homoeopathic medicines are being sold by pharmacies and farmers are attending courses on how to use them but there is very little actual assessment being undertaken as to their efficacy in farm animals and some fairly extravagant claims are being made, particularly for so-called ‘nosodes’. This continuing study seeks to resolve some of these issues both for myself on my farm and within my practice and also for the wider dissemination of information gained. The major problem I have found in utilising homoeopathy on my client farms is that good results are only achieved by using medicines that comply with the constitution of the individual animal and the totality of signs shown by it. Homoeopathy is a prescriptive form of medicine applied to the individual rather than a prescriptive application of a standard medicine for
the pathological condition being treated. It therefore requires particular knowledge of the individual to be able to use this type of therapy successfully.

**TREATMENT METHOD**

In addition to the relevant homoeopathic medicine for the signs being shown by the animal, plus her constitutional medicine, all mastitis cases were treated by regular stripping, usually a minimum of four-times daily until a clinical cure was achieved. In the Guernsey herd many infected quarters were stripped out every two hours until a major improvement was observed. Cold water hosing of the affected quarter was done concurrently if there was painful swelling and if the animal had a pyrexia (a temperature of 106°F was not uncommon with *Streptococcus uberis* mastitis). The medication was changed as signs changed and stopped when significant improvement had occurred. If a marked improvement was not achieved within 48 to 72 hours treatment was supplemented by parenteral and intra-mammary antibiotic therapy, usually for four days. Although a number of cows were systemically ill with marked pyrexia at the outset only one worsened significantly enough to require supportive therapy in terms of non-steroidal drugs or fluid therapy.

Milk samples were taken from most of the quarters affected and bacterial culture was conducted by the Langford Veterinary Investigation Centre. The California Milk Test (CMT) was used to assess when milk could be returned for sale, with organic withdrawal periods being observed where allopathic therapy proved necessary. The Delvotest SP antibiotic test (Gist Brocades, Delft, The Netherlands) was used to ensure that calves did not receive milk containing detectable antibiotic residues. Individual cow somatic cell counts (ICSCC) were recorded monthly using the National Milk Records service on the Holstein-Friesian herd. A successful treatment was recorded only if an ICSCC of less than 250,000 cells/ml was achieved for more than two consecutive months following the case in addition to a normal milk appearance and a normal palpation of the quarter.

**RESULTS**

**Guernsey herd**

Whatever the final outcome it was remarkable how well almost every case responded symptomatically to the combination of homoeopathy, the stripping and the cold water bathing. Almost without exception body temperature dropped to normal or near normal within 24 hours, and in some cases from as high as 106°F. The severe pain in a swollen quarter would reduce rapidly and be resolved within a similar period. The acute swelling also resolved fairly rapidly. Over the whole period of this study, that is three years in the Guernsey herd and two in the Holstein-Friesian herd, non-steroidal anti-inflammatory and anti-toxic therapy was required in only one case, even though some of the
animals would most definitely have required it on their initial clinical signs had they not responded so well to the alternative therapy. No fluid therapy was required. I use both non-steroidal drugs and intravenous hypertonic saline for mastitis therapy without much hesitation in my conventional practice.

However, when residual swelling and clotting of the milk was still present after three days, many of the cases could not be resolved without antibiotics. Most of these cases were caused by *Str. uberis*.

All mastitis cases arising in the Guernsey herd have been treated using the regimen given above from October 1998 to the present. In the twelve months to the end of September 1999 twenty cows suffered mastitis and fourteen (70%) responded to homoeopathy and stripping out without further treatment or recurrence. Of the fourteen cows that responded with only a single case occurring, *Staphylococcus aureus* was isolated from four, *Str. uberis* from three, *Staphylococcus pyogenes* from one and Serratia spp. from one. Milks from five cases were either not cultured or gave no growth. Recurrent cases were caused by *S. aureus* (three), *Str. uberis* (one), and *Escherichia coli* (one), with no bacteria recovered from one case.

The next twelve months saw seventeen cows affected of which twelve (70%) responded without recurrence. Of the twelve, *S. aureus* was isolated from one, *Str. uberis* from one, no bacteria were found in one sample and nine were not cultured. Of the five cows suffering recurrence, *S. aureus* was responsible for one, *Str. uberis* for one, with no bacteria recovered or no milk examined for the other three.

From October 2000 until the end of August 2001 fifteen cows were affected of which eight showed a good response (53%). Of the eight, *S. aureus* was isolated from three, *Str. uberis* from two, *E. coli* from one and no bacteria found from another, with one not sampled. Of those which did not respond without resorting to antibiotics *S. aureus* was grown from one, *Str. uberis* from two, *E. coli* from two (these last two were cull cows in which the mammary suspensory ligament had stretched and the udders had collapsed), one yielded no recoverable bacteria and one was not cultured.
Table 1. Outcome of clinical mastitis cases treated initially with homoeopathy in the Guernsey herd

<table>
<thead>
<tr>
<th>Time period</th>
<th>CLINICAL CASES</th>
<th>S. aureus</th>
<th>Str. uberis</th>
<th>E. coli</th>
<th>Others</th>
<th>No sample or no growth</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct 98-Sept 99</td>
<td>Primary ‘cure’</td>
<td>4</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>No response or recurring</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Oct 99-Sept 00</td>
<td>Primary ‘cure’</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>12</td>
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<td></td>
<td>No response or recurring</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Oct 00-Aug 01</td>
<td>Primary ‘cure’</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>No response or recurring</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>Primary ‘cure’</td>
<td>8</td>
<td>6</td>
<td>1</td>
<td>2</td>
<td>17</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>No response or recurring</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>0</td>
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<td></td>
<td>59</td>
<td>34</td>
<td>14</td>
<td>3</td>
<td>35</td>
<td>100</td>
</tr>
<tr>
<td>% ‘cure’</td>
<td></td>
<td>62</td>
<td>60</td>
<td>25</td>
<td>100</td>
<td>73</td>
<td>65</td>
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</tbody>
</table>

Non-responding cases were treated with systemic and intramammary antibiotics. Recurring cases were either treated homoeopathically or, if severe, with antibiotics as above, usually with good results. No cows were culled for mastitis apart from the two with collapsed udders. One other cow lost milk production from the affected quarter but regained it the next lactation. Whilst no individual cow somatic cell counting is undertaken on this herd the monthly bulk milk counts have been consistently below 250,000 cells/ml throughout this period.
Holstein-Friesian herd

Up until September 1999 most cases of mastitis in the Holstein-Friesian herd were treated with a combination of systemic and intramammary therapy. Since then all have been treated initially homoeopathically as above, resorting to antibiotics if the case did not start responding well within two to three days or if a relapse occurred.

During the initial twelve months twenty seven cows were treated homoeopathically for mastitis of which fifteen (55%) responded clinically and with the required reductions in the somatic cell count requirement for a ‘cure’ to be recorded. Twelve cows remained with a high individual SCC and six had one or more repeated clinical episodes. Of the responding cases Str. uberis was recovered from two, Bacillus spp from one, Proteus spp. from one and Serratia spp. from one. Nine cases did not have milk cultures undertaken (unfortunately if a rapid clinical response occurred no bacteriology was deemed necessary at this time although from the point of view of this paper it would have been highly relevant). Of the twelve cases that failed to respond without antibiotics six were caused by Str. uberis, one by Streptococcus dysgalactiae, two by S. aureus, one by a non-haemolytic staphylococcus and two by Corynebacterium spp. Non-responding cases, including six which recurred after homoeopathic treatment, and some cows with a persistently high cell count, were treated with antibiotics as previously described.

Since October 2000 fifteen cows have had clinical mastitis of which eight cases (53%) responded to homoeopathic therapy without recurrence or requiring antibiotics. Of the eight, Str. uberis was isolated from one case, E. coli from six, and a coagulase –ve staphylococcus from another. Of the seven non-responding cases that required antibiotic treatment three were caused by Str. uberis, one by Str. dysgalactiae, two by Serratia spp. and one sample was not cultured before antibiotic treatment ensued. Of these seven non-responding cases two recurred after homoeopathic treatment and were treated with antibiotics.
Table 2. Outcome of clinical mastitis cases treated initially with homoeopathy in the Holstein-Friesian herd

| Time period       | CLINICAL CASES |               |               |               |               |               |               |
|-------------------|----------------|---------------|---------------|---------------|---------------|---------------|
|                   | CASE           | S. aureus     | Str. uberis   | E. coli       | Others        | No sample or no growth | Total |
| Oct 99-Sept 00    | Primary SCC ‘cure’ | 0             | 2             | 0             | 3             | 9              | 15   |
|                   | No response    | 2             | 6             | 0             | 4             | 0              | 12   |
| Oct 00-Aug 01     | Primary SCC ‘cure’ | 0             | 1             | 6             | 1             | 0              | 8    |
|                   | No response    | 0             | 3             | 0             | 3             | 1              | 7    |
| Total             | Primary SCC ‘cure’ | 0             | 3             | 6             | 4             | 9              | 23   |
|                   | No response    | 2             | 9             | 30            | 7             | 1              | 20   |
| % cases           |                | 5             | 28            | 14            | 26            | 23             | 100  |
| % ‘cure’          |                | 0             | 25            | 100           | 36            | 90             | 53   |

Cows with a high ICSCC

In April 2000 eight cows showing a high ICSCC post-calving had milk from individual quarters selected by a CMT examined bacteriologically. The cows were then treated with the relevant constitutional homoeopathic medicine twice daily for three days using a vulval spray.

Two of these cows had had previous mastitis, one when she was dry. *Str. uberis* was isolated from six cows, Proteus spp. from one and *E. coli* from one. Five of the cows showed a significant improvement. Two cows showed a persistent reduction in cell count over the ensuing months from 200,000 cells/ml to 300, milk from one cow (the Proteus spp. case) declined from 2000 to 200 cells/ml and the *E. coli* case showed a decline from 3000 to 20 cells/ml. Three of the *Str. uberis* infected quarters sustained a high cell count but without clinical mastitis.

In January and February 2001 six cows were selected in the same way for a similar treatment. Two quarters contained *Str. dysgalactiae*, one Serratia spp., one Bacillus spp. and two non-haemolytic staphylococci. None showed a significant response and were eventually treated with antibiotics.
DISCUSSION

The high level of mastitis suffered by the Holstein-Friesian herd in particular following the conversion to an organic system proved deeply concerning in view of the sustained measures used routinely on this farm to control the condition.

The parlours are tested twice yearly, once with a dynamic test. Teat liners are changed according to manufacturer’s recommendations, and milking is into large-volume claw bowls. Twice-daily hot water circulation cleaning is in use. Cows’ teats are washed if visibly dirty, and all teats are wiped with an individual disinfectant wipe or pre-dipped and wiped. Post-milking all teats are dipped with a high quality iodine disinfectant containing, glycerine and lanolin as emollients. High cell count cows and any mastitis cases are milked with a separate cluster to those used for the main herd and these ‘mastitis’ clusters are kept constantly flushed with a cold water hose when not in use during the milking period. Mastitic and antibiotic contaminated milk is passed into dump churns.

Cubicle conditions are excellent with concrete beds covered with a high-density foam mattress and a thick rubber mat. The comfort of these beds was instrumental in completely preventing lameness during the housing periods of the last two winters. Beds are brushed off, dry straw added and passages scraped, all twice daily. A thin dusting of lime was used every two days on the beds until February 2000 when this was replaced by a powder disinfectant (Zal Drysan, Deosan, Diversey Lever) that releases chlorine on contact with moisture. The effect of this change on teat condition and mastitis was dramatic. Although the skin of the teats had no lesions before the change it was very dry compared with that of cattle kept in the dry cow loose yards that were not limed. Within two weeks of changing from lime to Drysan teat condition had improved significantly and the number of mastitis cases in cows that had calved in the previous months fell equally dramatically. I postulate that this was due to the teat ends regaining their normal suppleness and the teat duct closing more efficiently and quickly.

The second change that has made a marked difference in the Holstein-Friesian herd was the removal of loose-straw bedded yards for housing dry cows. These loose yards were well drained, cleaned out fortnightly and space allowances exceeded Soil Association requirements, with large amounts of fresh, dry straw added daily. An iodine barrier teat dip (Ioshield, Henkel Ecolab) or an external teat sealant (Dryflex, De Laval) was applied every four to five days. In spite of these measures dry cow mastitis became a problem and far too many cows calved down in the winter and spring of 1998/1999 and 1999/2000 with a high cell count, with or without clinical mastitis in the succeeding weeks. *Str. uberis* was isolated in most of the mastitis cases and from the high cell count quarters. This problem was accentuated by the change over the last three years from a summer/autumn calving pattern to spring calving, requiring the cows
to be dried off during the housing period. The loose yards were replaced for the winter of 2000/2001 with portable cubicles using the same type of matting system and management as used for the milking animals.

The third management change was to alter the method of drying off cows for the winter of 2000/2001. Previously, cows were separated from the main herd at the end of lactation when giving less than eight litres of milk, stopped milking abruptly, put into a straw yard and fed straw for four to five days or until dry, with supplementary hay or big bale silage being added when their milk production had stopped. This proved distressing for all concerned, with constipated cows, some leaking milk, and no less than seven dry cow mastitis cases during the winter of 1999/2000. The procedure now being followed successfully is to milk the cows at the end of lactation once daily for a week, separate them off into the dry cow cubicles and milk them three or four times every two days, discarding this milk, then stop milking and use the Ioshield dip as before. Milk from the every-other-day milking of these cows is discarded to avoid raising the bulk milk somatic cell count.

These measures have stopped the dry cow mastitis and the stress of drying off completely, as well as leading to many fewer cows showing a high cell count at the start of lactation, without unfortunately eliminating them entirely. The number of clinical cases of mastitis overall has been halved, to the equivalent of twenty-one affected cows per hundred cows and twenty-five cases per hundred cows per year, levels which compare well with most conventional herds. The rolling three-monthly herd cell count is approximately 200,000 cells/ml on this NMR recorded herd with an average annual yield of 7000 litres/cow.

Results of treatment with the non-antibiotic and homoeopathic regime showed response rates of more than 50% in the Holstein-Friesian herd and 70% in two out of three years in the Guernsey herd, with an effective response in virtually all E. coli cases. The improvement in the systemic signs was a revelation, even if the mastitis required antibiotic assistance to clear. Most failures were in cases caused by Str. uberis and the impending licensing of an internal teat sealant may well be helpful in preventing this environmental organism invading the udder during the dry period.

The conclusions drawn so far with non-antibiotic treatment of mastitis are that it can have a role to play in the treatment of clinical mastitis, particularly on organic farms. However, because homoeopathic therapy as used here relies on relating the medicines used to the signs and the constitution of the animal, it is not easy to apply without a degree of knowledge and experience. Nevertheless, there are enthusiastic farmers and stock-persons using homoeopathy and claiming success against mastitis. Where the type of infection can be recognised clinically as being caused by Gram-positive bacteria, particularly Str. uberis, it may be better to treat with a combination of injectable and intra-
mammary antibiotics immediately rather than create potentially chronically infected cows, although the systemic signs are likely to be helped with homoeopathic medicines, in addition to the conventional therapy. This means accepting the costs of the prolonged milk discard. There is always a place for the repeated stripping out and cold-water bathing of the affected quarter no matter what treatment is used. I advise this on my conventional clients herds, although it is a time consuming business and requires easy, convenient access to the patient and good handling facilities.

There is no doubt that prevention of mastitis is far better than cure, whatever the therapeutic route chosen. The measures taken above illustrate what can be done to reduce the incidence. The standard of management and housing of the dry cows needs to be very high on organic farms in order to prevent infections picked up during the dry period becoming a problem during lactation. I am convinced that deep-littered straw yards are not suitable housing for dry or lactating dairy cows, especially for potentially high genetic merit animals genetically programmed to give high yields in fast milking times through poorly closing teat canals. Large and comfortable cubicles are needed for dry cows. Calving areas need special attention and with my own herd these are cleaned out after each calving, with sand being put down under fresh bedding. Wet straw following calving is removed and replaced. The calf is removed after twenty-four hours to reduce stress on the mother and calf. Great emphasis is placed on reducing stress on the cows as a means of disease prevention and mastitis is no exception. Presently available external teat sealants seem minimally effective in preventing infection, and the impending UK licensing of the internal teat sealant that is presently used in New Zealand is eagerly awaited.

REFERENCES