Quarantine treatments for Liver Fluke

Quarantine treatment strategies for liver fluke are not straightforward. They must take account of environmental risk factors e.g. mud snail habitat, grazing management, farm history etc. together with the spectrum and efficacy of the different flukicides. Quarantine treatment strategies for liver fluke in introduced sheep, cattle or goats should be for farms considered "at risk" in consultation with a veterinarian or advisor.

There are three different scenarios to consider:

1. Animals may be introduced onto a farm with no known snail habitats and therefore no history of fluke infection. The risk of any fluke introduced in these animals establishing on the farm is zero without a snail habitat. Treatment in this case is only intended to remove fluke in the sheep for the sake of their health. Treatment with a flukicide active against immatures is advised, with faecal egg count (FEC) monitoring in subsequent months to detect any small residual burden.
2. The farm may have areas considered to be a suitable habitat for snails but no history of liver fluke infection. The risk of introduced fluke establishing on the farm is significant so treatment is aimed at removing all fluke, including any resistant fluke.
3. Liver fluke may be endemic on the farm, so introducing small numbers of fluke will not be serious, particularly if wildlife reservoirs exist. However, if the endemic fluke are fully flukicide susceptible, the consequences of introducing resistant fluke are potentially serious.

Choosing a quarantine treatment strategy

The following factors should be considered when choosing a quarantine treatment strategy.

- Resistance to triclabendazole (TCBZ) is increasing in the UK but, in most cases, treatment with TCBZ will remove a high proportion of susceptible flukes of all stages
- Treatment with TCBZ alone will not remove TCBZ-resistant fluke
- Treatment with closantel or nitroxynil is expected to prevent the output of fluke eggs for at least 8 weeks, probably longer, provided the fluke are susceptible to the drug used. If the introduced sheep are infected with young immature fluke, treatment will have to be repeated after the immatures are old enough to be killed by these products (see figure 10) and using of two doses of closantel given 6 weeks apart (nitroxynil a minimum of 7 weeks apart for sheep) should be considered.
- Resistance to albendazole, closantel and nitroxynil has been reported in other countries but not in the UK.
- Treatment with more than one product with activity against immature flukes (closantel, nitroxynil, TCBZ) will reduce the risk of introducing fluke with resistance to any one product. It is not recommended, however, that two products are used at the same time, because of the potential risk to the health of the sheep.
- Sheep can pass fluke eggs for up to 3 weeks after adult fluke are killed so sheep should be kept on the quarantine area or pastures with no fluke habitat for at least 4 weeks after treatment.
- FEC and/or coproantigen ELISA monitoring can be used to determine the need for treatments and the product choice and timing.

Table 3. Efficacy of flukicides available for us in sheep in the UK against susceptible fluke populations.

<table>
<tr><th rowspan="2">Flukicide</th><th colspan="14">Age of fluke (weeks)</th></tr>
<tr><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>9</th><th>10</th><th>11</th><th>12</th><th>13</th><th>14</th></tr>
<tr><td>Albendazole</td><td colspan="9" rowspan="2"></td><td colspan="2" rowspan="2">50-70%</td><td colspan="3" rowspan="2">80-99%</td></tr>
<tr><td>Oxyclozanide</td></tr>
<tr><td>Nitroxynil</td><td colspan="7" rowspan="2"></td><td colspan="2" rowspan="2">50-90%</td><td colspan="5" rowspan="2">91-99%</td></tr>
<tr><td>Closantel</td></tr>
<tr><td>Triclabendazole</td><td colspan="3">90-99%</td><td colspan="11">99-99.9%</td></tr>
</table>

Table adapted from Fairweather and Boray, 1999