



## **Liver Fluke Treatments for Cattle and Sheep - Rafoxanide is not an appropriate alternative to closantel.**

Liver fluke is shaping up to be a significant challenge this winter so livestock farmers need to be on their guard and monitor the situation carefully. With a very limited number of different flukicides available and reports of resistance to triclabendazole (TCBZ) increasing every year, choice of treatment is extremely important. SCOPS and COWS are committed to try to provide clear advice on the options available.

As part of this commitment, we are aware that there has been confusion with respect to two veterinary medicines that are not currently authorised in the UK, but which have been imported from the ROI, under a Special Import Certificate from the Veterinary Medicines Directorate, for use on some UK farms. These veterinary medicines both contain the active substance rafoxanide. SCOPS and COWS are aware that there is some confusion around rafoxanide especially with respect to using it as an alternative to closantel on farms where triclabendazole resistance is proven. This paper aims to clarify the situation.

**Rafoxanide is not a new flukicide.** It has been available in some countries, for example Australia and the ROI since the 1980s.

**Rafoxanide is a salicylanilide anthelmintic.** Other compounds in this class include closantel and oxyclozanide\*. Hence rafoxanide is **not** a different class of flukicide to closantel. Rafoxanide and closantel are similar in chemical structure and mode of action. There is evidence of cross-resistance between rafoxanide and closantel from both field and laboratory studies (Boray and de Bono, 1989).

**Why is this important?** This is extremely important because it means there is no evidence to suggest that using closantel and rafoxanide interchangeably/on a rotational basis will successfully reduce the selection pressure for resistance to closantel. Indeed, there is a serious risk that such use of rafoxanide will hasten the development of resistance to closantel. Hence rafoxanide is not considered an appropriate alternative to closantel.

*\*Fluke isolates resistant to rafoxanide and closantel showed no side resistance to oxyclozanide (another member of the salicylanilide group). It is thought this is because of the different pharmacokinetics of oxyclozanide and that it is only effective against its effect adult fluke.*



SCOPS and COWS recommend that veterinary medicines are used to target the predominant age of fluke likely to be present in a group of animals at a particular time (e.g. immature fluke in autumn, adult fluke in spring and summer). We strongly advise using appropriate diagnostic tests before each treatment is given.

Closantel is a useful drug to control immature fluke in autumn, but alternatives such as nitroxynil, albendazole, oxcyclozanide or clorsulon can be used at other times of year when adult fluke predominate. See the Tables below:

**Table of Flukicides (sheep)**

Active Ingredient	Age of fluke (% kill rate)												Optimum time of year to use
	1	2	3	4	5	6	7	8	9	10	11	12+	
Albendazole											50-70%	80-99%	Spring/Summer
Oxcyclozanide											50-70%	80-99%	Spring/Summer
Nitroxynil							50-90%			91-99%		Late Autumn/Winter	
Closantel			23-73%	91%	91-95%			97-100%				Autumn	
Triclabendazole*	90-99%	99.0-99.9%											Autumn

\*Assuming a fully susceptible population.

Thanks to Prof Diana Williams for this table

More details: [Liver Fluke Treatment options](#)

**Table of Flukicides (cattle)**

Active ingredient	Administration route	Stage of fluke killed
Triclabendazole	Oral	2 weeks onwards
	Pour-on	6-8 weeks onwards
Closantel	s/c injection or pour-on	7 weeks onwards
Nitroxynil	s/c injection	8 weeks onwards
Clorsulon	s/c injection	Adults only
Oxcyclozanide	Oral	Adults only
Albendazole	Oral	Adults only

More details: [http://beefandlamb.ahdb.org.uk/wp-content/uploads/2019/01/ParasiteControl20192358 WEB.pdf](http://beefandlamb.ahdb.org.uk/wp-content/uploads/2019/01/ParasiteControl20192358_WEB.pdf)

