



UPDATE June 2023

Liver Fluke Treatments for Cattle and Sheep - Rafoxanide is NOT an alternative to closantel

In recent years, there has been confusion around rafoxanide, especially with respect to its use as an alternative to closantel on farms where triclabendazole resistance is suspected. In the light of a product containing rafoxanide recently being licensed in the UK (POM-V) for use in sheep as a treatment for adult liver fluke, SCOPS and COWS wish to clarify their position regarding the use of this active.

SCOPS and COWS are committed to providing clear advice on the treatment options available. With a very limited number of different flukicide actives in our armoury, and increasing reports of resistance to triclabendazole (TCBZ), product choice is extremely important.

The important facts are:

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

Rafoxanide is a salicylanilide anthelmintic. Other compounds in this class include closantel and oxyclozanide*. Therefore, rafoxanide is **NOT** a different class of flukicide. 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 important because it means there is no evidence to suggest that using closantel and rafoxanide interchangeably, or on a rotational basis, will 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.

When can we use rafoxanide? If closantel has not been used earlier in the season, then rafoxanide could be used as an adulticide in the spring or early summer.



TREATMENT CHOICE

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

Closantel is a useful option for the control of immature fluke in autumn, but alternatives such as albendazole, oxcyclozanide or clorsulon (cattle) 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 in weeks (% kill rate)												Optimum time of year to use
	1	2	3	4	5	6	7	8	9	10	11	12+	
Albendazole (adults only)											50-70%	80-99%	Spring/Summer
Oxcyclozanide* (adults only)											50-70%	80-99%	Spring/Summer
Rafoxanide** (adults only)											80-99%		Spring/Summer
Closantel****			23-73%	91%	91-95%						97-100%		Autumn
Triclabendazole***	90-99%										99.0-99.9%		Autumn

Thanks to Prof Diana Williams for this table

* *Fluke isolates resistant to rafoxanide and closantel showed no side resistance to oxcyclozanide (another member of the salicylanilide group). It is thought this is because of the different pharmacokinetics of oxcyclozanide.*

** *Rafoxanide is not licensed for use in cattle; other suitable products are available in cases where triclabendazole resistance has been proven*

*** *Assuming a fully susceptible population.*

**** *Closantel is an option for treating sheep diagnosed with Haemonchus contortus infection. Increased use of closantel for Haemonchus will add additional selection pressure for resistance on liver fluke populations.*

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



Table 1: Summary of the flukicide actives available in the UK for use on cattle*

Active Ingredient	Administration Route	Stage of liver fluke killed
Triclabendazole	Oral	2 weeks onwards
	Pour-on	6-8 weeks onwards
Closantel	S/c injection or pour-on	7 weeks onwards
Clorsulon	S/c injection	Adults only
Oxyclozanide	Oral	Adults only
Albendazole	Oral	Adults only

More details: http://beefandlamb.ahdb.org.uk/wp-content/uploads/2019/01/ParasiteControl20192358_WEB.pdf