



HAL
open science

Efficacy of a targeted selective treatment in dairy herds affected by clinical dictyocaulosis.

T. Lurier, Thomas Hilaire, Philippe Camuset, G. Bourgoin, Marie-Anne Arcangioli

► To cite this version:

T. Lurier, Thomas Hilaire, Philippe Camuset, G. Bourgoin, Marie-Anne Arcangioli. Efficacy of a targeted selective treatment in dairy herds affected by clinical dictyocaulosis.. 31st WORLD BUIATRICS CONGRESS, National Association of Spanish Specialists in Bovine Medicine (ANEMBE); World Association for Buiatrics (WAB), Sep 2022, Madrid, Spain. hal-03838494

HAL Id: hal-03838494

<https://hal.inrae.fr/hal-03838494>

Submitted on 3 Nov 2022

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution - NonCommercial - NoDerivatives 4.0 International License

EFFICACY OF A TARGETED SELECTIVE TREATMENT IN DAIRY HERDS AFFECTED BY CLINICAL DICTYOCAULOSIS

Thibaut LURIER^{1,2}, Thomas HILAIRE¹, Claire HENON¹, Philippe CAMUSET³, Gilles
BOURGOIN^{1,4}, Marie-Anne ARCANGIOLI¹

1-VetAgro Sup, 2-UMR EpiA, 3- Caux Seine veterinary practice 4-UMR 5558



Bovine dictyocaulosis

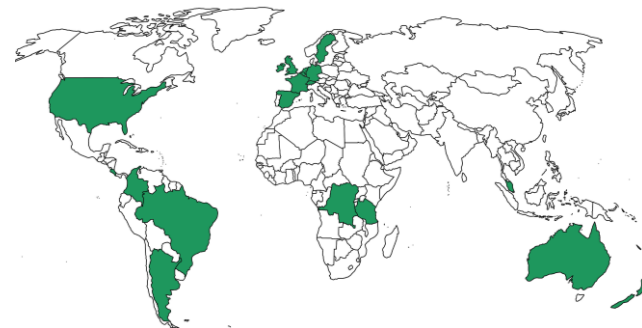
- Dictyocaulosis is a worldwide parasitic disease reported in most temperate country
- Prevalence \approx 80% of herds with enzootic cough in pasture during summer (France, *Lurier et al. 2018*)

- Economic importance

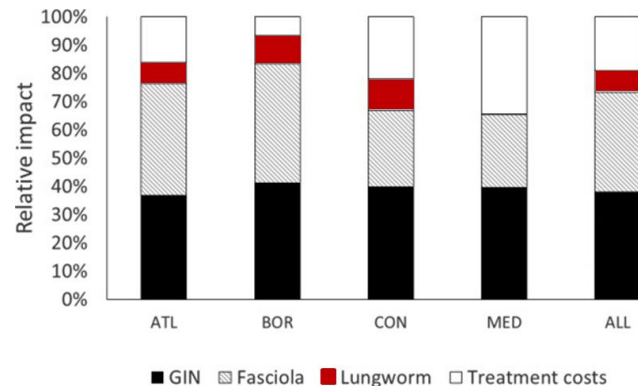
Clinical outbreaks cost = **159-167€/cows** (*Holzhauser et al., 2011*)

⇒ Decreased milk production (30/50% of cost), mortality (30/50% of cost), extra AI + veterinary expense (12-15%)

At EU level : **€ 139 million** [€ 86–225 million] in **cattle** (*Charlier et al. 2020*)



Country with reported cases of dictyocaulosis



Relative economic impact of dictyocaulosis among other parasitic disease according to the climate in Europe

Diagnostic in adult cattle (*Lurier et al. 2018*)

- Routine method : **Baermann / Mc Kenna sedimentation**

Sp = 100%, Se = 7.4%

- **Broncho-alveolar Lavage (BAL)**

- Presence of eggs or larvae :

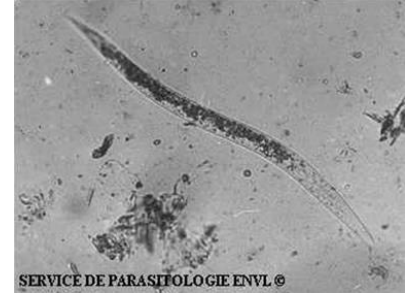
Sp = 100%, Se = 24.7 %

- **Eosinophils proportion > 4.77% in BALF cytology**

Sp = 85.2% & Se = 85.2%

- **Serology** not available in France, Seuil = 0.389 ODR

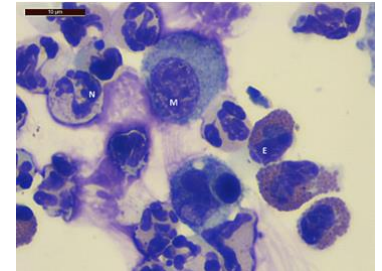
Sp = 85.7% & Se=76.2%



D. Viviparus L3 in feces



D. Viviparus adult in BALF



BALF cytology with eosinophils

Treatment of dictyocaulosis

- Most anthelmintic are effective against *D.viviparus*
 - Very few treatment failure reported : eprinomectine (Rigaud et al. 2019), Albendazol (Coles et al. 2010), Abamectine and moxidectine (Molento et al. 2006)
- Routinely
 - Blanket treatment applied to all cows without confirmatory diagnostic
 - Potential **unnecessary treatment**
 - Potential selection of **anthelmintic resistance** in *D. viviparus* or in other gastrointestinal nematodes
- No **targeted selective treatment protocols** assessed for Dictyocaulosis control in cattle

Pilot study design 1/2

Objectives

- Assess the efficacy of a targeted selected treatment of dairy cattle for :
 - Resolving clinical manifestation of dictyocaulosis in the herd
 - Limit the incidence of the disease in non-treated animal

Methods

- Inclusion of herds with a veterinary dictyocaulosis suspicion in two French regions
- **Confirmatory diagnosis** by bronchoalveolar lavage and Mc Kenna sedimentation
- **Targeted selective treatment of 50%** of the herd with eprinomectine injectable
- **Longitudinal follow up** until 3 month post treatment

Pilot study design 2/2

D0

Diagnostic

Random selection of
6 cows (3
primiparous and 3
multiparous)

BAL,
Individual Mc Kenna
Pooled Mc Kenna

D3-D8

Treatment

Treatment with
Eprecis ND
(0,2mg/kg)

Primiparous
Postpartum cows
Clinically affected
animals

D30

Immediate
follow up

Herd clinical signs according to the farmer

BAL,
Individual Mc Kenna on the 6 followed
cows

Pooled Mc Kenna on 10 primiparous cows

D90

Long-term
follow-up

Rational for treatment

Eprecis ND CEVA (eprinomectine)

- Posology 0.2 mg/kg
- **Injectable** eprinomectine (suitable for selective treatment)
- 2 weeks protection against reinfestation by *D.viviparus*

Treated animals

- Clinically affected (cough)
- **Primiparous** (naive cows => most at risk to amplify the presence *D.viviparus*)
- Post partum cows (until 15 days after calving)

Results : Initial visit

- Only 6 herd enrolled
- Diagnostic positive in 4/6 (66%) herds
 - 1 herd excluded (non-compliance with treatment protocol)
- Animal level prevalence
 - **Primiparous** 6/9 LBA
2/9 Mc Kenna
 - **Multiparous** 1/9 LBA
1/9 Mc Kenna
- Only 1/3 pooled Mc Kenna positive

	Herd	Cows	Eosinophil %	Mc Kenna	Pooled Mc kenna
Primiparous	A	5824	27,75	0	0
		5834	20,75	0	
		5813	4,75	0	
	B	1782	15	1	1
		1808	7,5	0	
		1777	7,5	1	
	C	763	2,5	0	0
		4385	3,5	0	
		769	21,5	0	
	D	8969	0,1	0	0
		2708	0	0	
		4365	0,5	0	
	E	1301	0	0	0
		1465	0	0	
		4627	1,2	0	
Multiparous	A	7064	4,2	0	1
		3493	1	0	
		3489	16	1	
	B	1581	0	0	0
		1565	0	0	
		1642	2	0	
	C	3864	2	0	0
		8525	3	0	
		827	1,4	0	
	D	8670	0,2	0	0
		9912	0	0	
		6277	0	0	
	E	6679	0	0	0
		M3	1,2	0	

Results : Follow-up

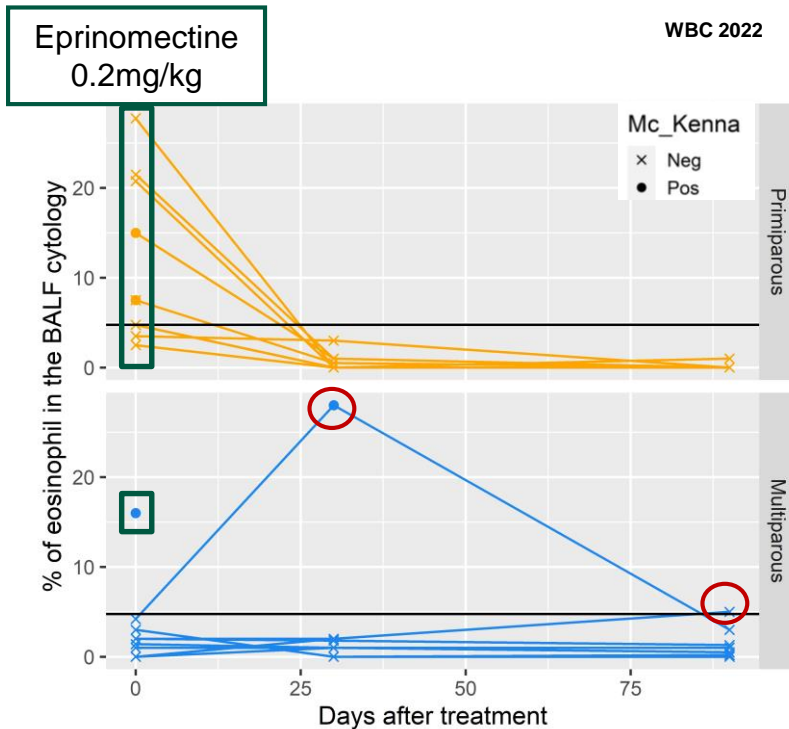
• Primiparous

- All 9/9 primiparous (treated) were negative to LBA and Mc Kenna at D30 and D90

• Multiparous

- 2 excluded cows
 - **1 treated** (cough) replaced by another cows at D30
 - 1 culled at D90
- 2/8 primiparous (not treated) were positive to LBA or Mc Kenna at D30 and D90

⇒ **Incidence rate : 4.4%/month in non treated multiparous
2%/month for all susceptible cows**



Individual follow-up of the BALF cytology (the black line is the positivity cutoff of the eosinophils %)

Clinical follow up : Tachypnea & lung auscultation modification

- **Abnormal clinical examination at D0**
 - 3/9 primiparous
 - 1/8 multiparous
- **During follow-up**
 - Persistence of the **abnormal clinical signs in 2/4** primiparous and **1/1 multiparous**
 - No newly clinically affected cows
- **According to the farmer**
 - **Resolution of the clinical signs in 2/3** herds
 - Persistence of **cough in 1 herd** without needs for supplementary treatments

Discussion

- **Interest of the targeted selected treatment**
 - No re-infestation in primiparous cows
 - No new clinical manifestation after treatment
 - Low incidence (4.4%/month) of *D.viviparus* infestation in non-treated cows
- **Few herds corresponding to the inclusion criteria**
 - Dry weather limiting the contamination of the pasture
 - ⇒ Could have limited the number of lungworm outbreaks
 - ⇒ Could also have favored the good response to the targeted selected treatment
- **Only a proof of concept without control groups**
 - Need to be reproduced with a larger number of herds
 - The targeted selected treatment strategy needs to be compared with a blanket treatment strategy in a randomized control trial

Conclusion and take-home message

- **Importance of the initial diagnosis**
 - 2/6 herds presenting enzootic cough at pasture during summer without dictyocaulosis
 - Confirmation of the higher sensitivity of the bronchoalveolar lavage compared to the Mc Kenna sedimentation in adult cows
- **Potential interest of a targeted selected treatment in dairy cows by treating**
 - Clinically affected animals
 - Primiparous and newly introduced animals
 - Early post-partum cows

Acknowledgment

- This study was funded by CEVA France who provides the Eprecis ND and some financial supports
- We also acknowledge
 - The farmers who accept to participate to this study
 - Nathalie Menudier, Damien Remmy (CEVA) for their implication in this project



Thank you for your attention



**RÉPUBLIQUE
FRANÇAISE**

*Liberté
Égalité
Fraternité*



VetAgro Sup

31 **WBC**

WORLD BUiatrics CONGRESS
SEPTEMBER 4TH TO 8TH
MADRID 2022

www.wbc-madrid2022.com

