

# Effects of different proportion of pellets of sainfoin (*Onobrychis viciifolia*) combined or not with hazel nut peels in lambs infected with *Haemonchus contortus*.

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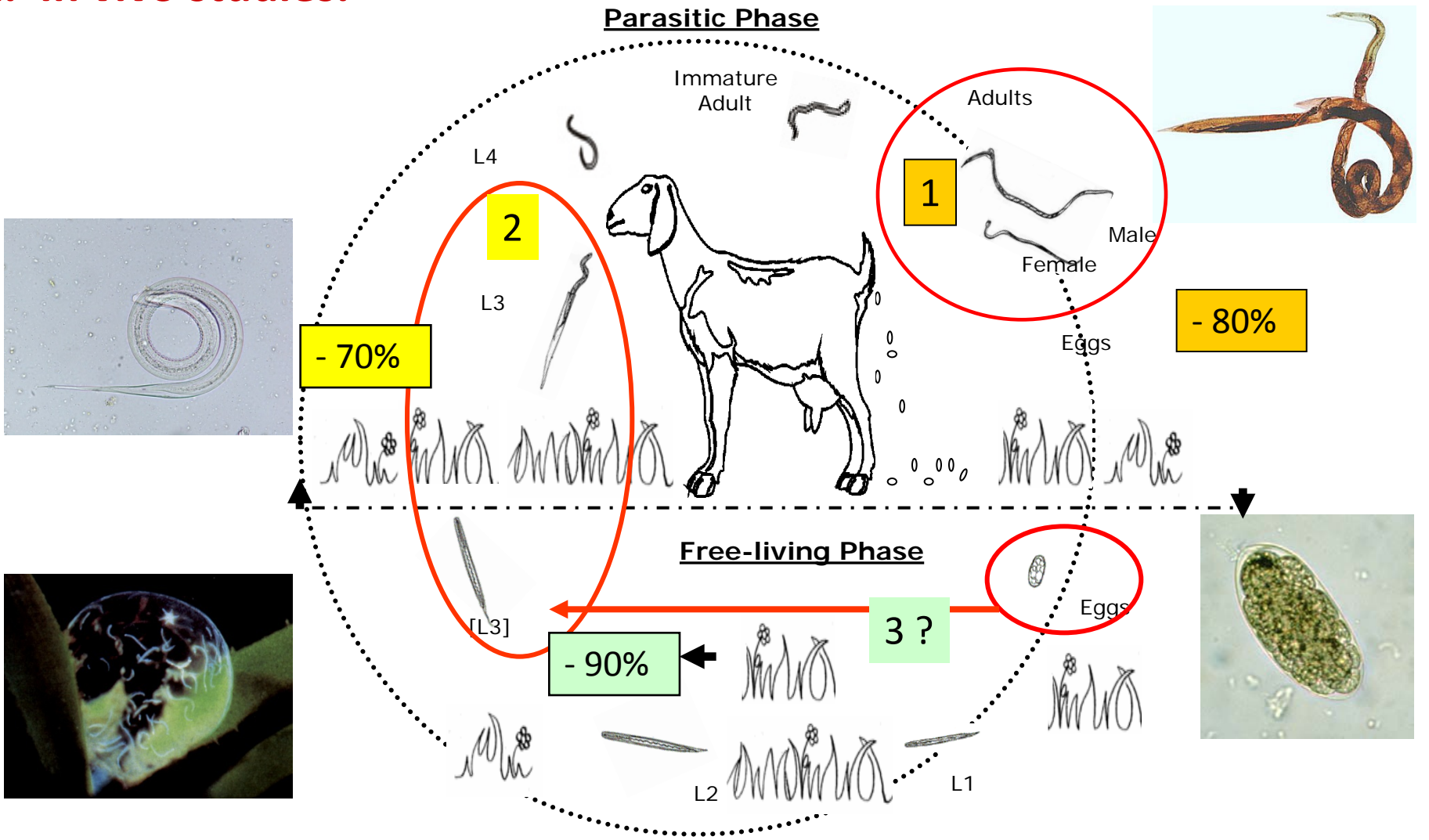
- Gastro Intestinal Nematodes (GINs) remain worldwide, a major threat for production of grazing ruminants.
- Chemical AHs were the usual mode to control GINs.
- The development / spread of resistances to these AHs challenges the exclusive reliance on chemical drugs to control GINs.
- There is thus a strong need to find alternative solutions which will better correspond to sustainable agriculture.
- One of these alternative options is the use of tannin-rich (TR) resources with AH properties.



- Early data have been obtained on the potential use of **TR Legumes** (e.g. sulla, big or birdsfoot trefoils, sericea lespedeza) (Rochfort et al, 2008 )
- **Sainfoin** (*Onobrychis viciifoliae*) (grazed, hay, silage, pellets)  
(Paolini et al, 2003, 2005; Heckendorn et al, 2006, 2007, Manolaraki et al, 2010)
- Then, the possible exploitation of other TR resources has also been underlined, including some **agro industrial by-products** (e.g. hazel nut peels)



# 1. In vivo studies.





Parce que la nature a des idées,  
nous avons la responsabilité de l'écouter...



Meilleurs voeux 2011



## Do the technological processes affect the tannins of sainfoin ?

- Are the AH effects associated with the consumption of sainfoin maintained in the pellets ?
- Are these effects dose dependent ?

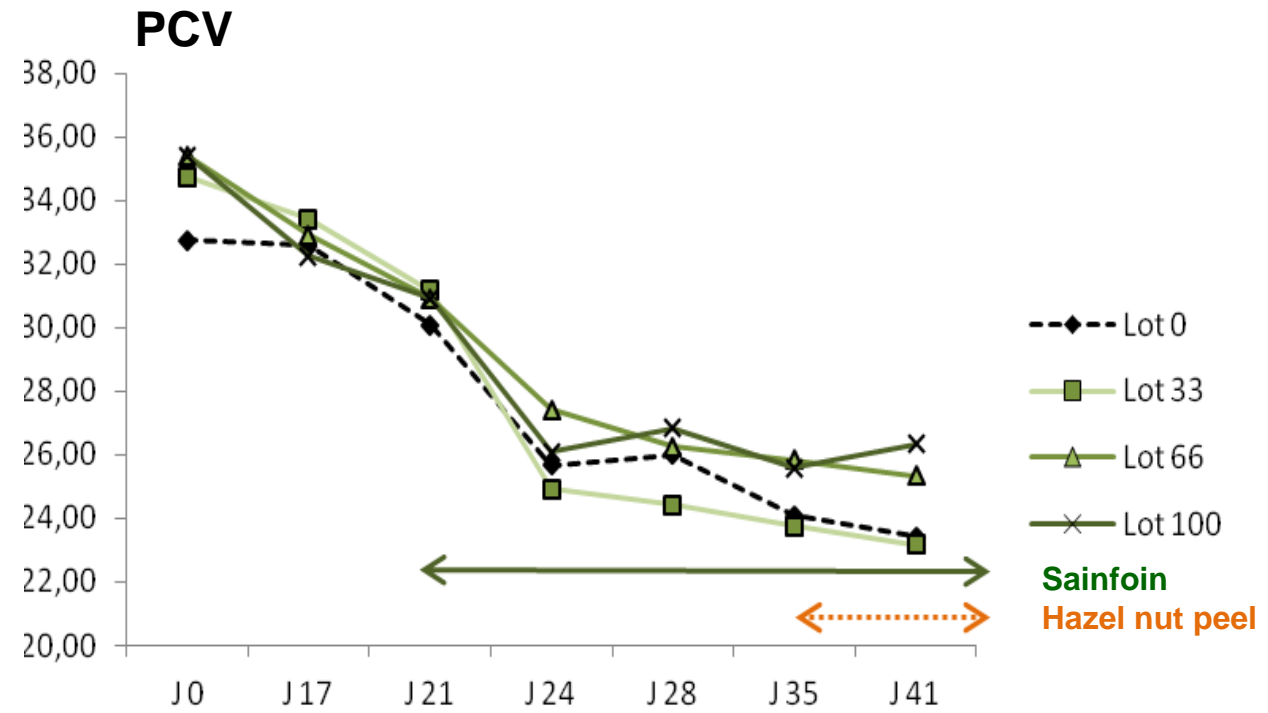
- 24 Tarasco Bearnais, 4-month old, lambs
- Infection with 4000 infective larvae of *H. contortus* on D0
- Divided in 4 groups on D21 according to the diet (pellets + hay)
- Slaughter on D42

	D0	D17	D21	D35	D42
<b>G0</b>	Lucerne		Lucerne		Lucerne
<b>G33</b>		Adaptation	Sainfoin 33 %		Sainfoin + Hazel nut
<b>G66</b>		Adaptation	Sainfoin 66 %		Sainfoin + Hazel nut
<b>G100</b>		Adaptation	Sainfoin 100 %		Sainfoin + Hazel nut

**Measurements:** Tannin content (Folin Ciocalteu), IC50 (LEIA)  
 Refusals, Lamb Growth (DWG)  
 Packed Cell volume (PCV)  
 Faecal Egg counts, Worm counts at necropsy

Tannin content: Sainfoin pellets = 0,9 %      Hazel nut peels = 78 %  
 EC 50 values : Sainfoin pellets = 569 (µg/ml)      Hazel nut peels < 150 (µg/ml)  
 (LEI Assay)

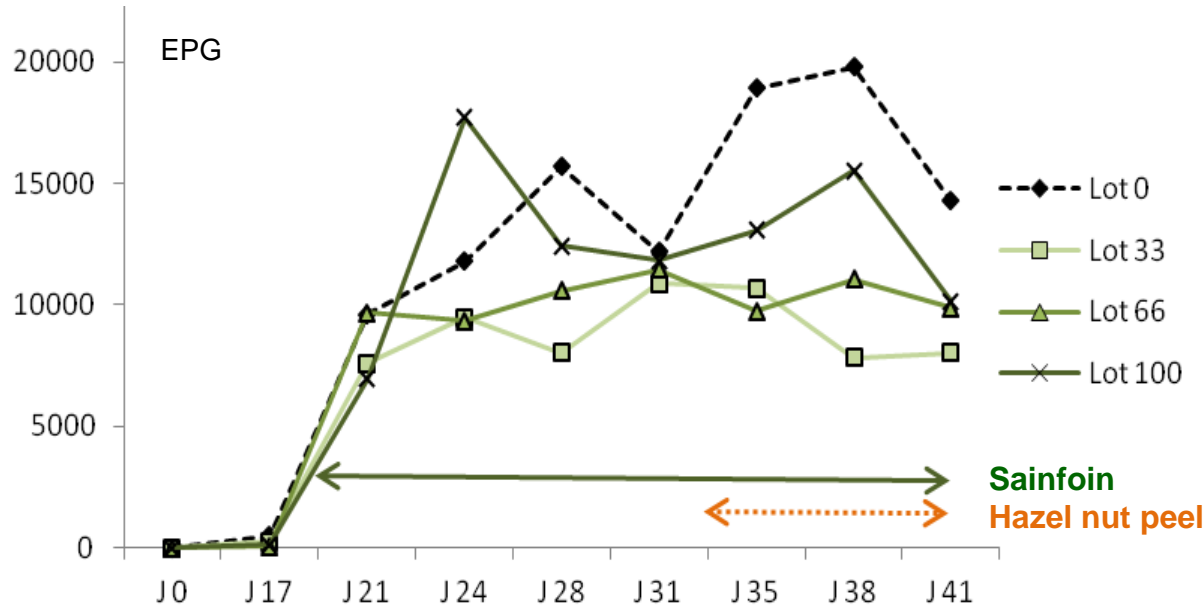
	PROPOSED / group (Kgs)			REFUSALS / group		Tannin content		DWG
	Luzerne Pellets	Sainfoin Pellets	HN peels	Pellets (Kgs)	HN peels (Kgs)	D21 to D34	D35 to D42	D -15 to D42
<b>G0</b>	3	0	0	0	0	0	0	143 g (+/- 21)
<b>G33</b>	2	1	1,8	0	1,08	0,9	<b>6.5</b>	101 g (+/- 40)
<b>G66</b>	1	2	1,8	0	1,35	1,8	<b>5.4</b>	117 g (+/- 49)
<b>G100</b>	0	1	1,8	0	1,04	2,6	<b>7.2</b>	105 g (+/- 47)



No difference between Sainfoin vs luzerne

No dose effect





## Mean Worm Counts

<b>G0</b>	1367
<b>G33</b>	1186
<b>G66</b>	1532
<b>G100</b>	1662

**Table1:** Relative EPG reduction in the experimental groups and statistical results

	Gr 33	Gr 66	Gr 100	ANOVA 1	Rptd ANOVA	Rptd ANOVA
D24	19,6	20,8	-50,1	NS	P < 0,08	NS
D 28	<b>48,8</b>	<b>32,7</b>	20,7	NS		
D31	10,9	6,1	3,1	NS		
D 35	<b>43,5</b>	<b>48,5</b>	<b>30,9</b>	<b>P &lt; 0,09</b>		<b>P &lt; 0,02</b>
D38	<b>60,5</b>	<b>44,3</b>	21,6	<b>P &lt; 0,08</b>		
D 41	<b>43,8</b>	<b>30,8</b>	<b>29,0</b>	<b>P &lt; 0,10</b>		

- The effects of TR resources on FEC seem confirmed with the HAZEL NUT peels but NOT with the SAINFOIN pellets.
- However, there is some variability in the quality of sainfoin pellets which seems worth to be explored

	APM 1	APM2	APM3	AOCH1	AOCH2
IC50 (µg/ml)	539	330	318	120	213

- No dose dependent effects were found but suggestions of some threshold effect



Development of integrated livestock breeding and management strategies to improve animal health, product quality and performance in European organic and 'low input' milk, meat and egg production



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Thank you for your attention !

