

#### Integrated control of goat gastrointestinal parasitism: an example in the humid tropics.

Maurice Mahieu, Rémy R. Arquet, Gisèle Alexandre, Maryline Boval, Jean-Christophe Bambou, Harry Archimède, Carine Marie-Magdeleine, Nathalie Mandonnet

#### ▶ To cite this version:

Maurice Mahieu, Rémy R. Arquet, Gisèle Alexandre, Maryline Boval, Jean-Christophe Bambou, et al.. Integrated control of goat gastrointestinal parasitism : an example in the humid tropics.. 11. International Conference on Goats (ICG), Sep 2012, Gran Canaria, Spain. hal-02806169

#### HAL Id: hal-02806169 https://hal.inrae.fr/hal-02806169

Submitted on 6 Jun2020

**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.



XI International Conference on Goats (ICG 2012), Gran Canaria, Spain

# Integrated control of goat gastrointestinal parasitism: an example in the humid tropics

Mahieu, Arquet, Alexandre, Boval, Bambou,

Archimède, Marie-Magdeleine, Mandonnet

ALIMENTATION AGRICULTURE ENVIRONNEMENT



Gastro-Intestinal Nematodes (GIN) cause heavy losses to goat industry, up to 50% of the production potential

### Major concern: Anthelmintic Resistance (AR)

Faecal Egg Count Reduction Test on 21 goat farms (late 2011)

| Anthelmintic class   | drug        | farms in the<br>survey | farms with AR |
|----------------------|-------------|------------------------|---------------|
| Benzimidazoles       | netobimin   | 13                     | 13            |
| Imidothiazoles       | levamisole  | 7                      | 6             |
| Macrocyclic lactones | ivermectine | 17                     | 15            |
| Macrocyclic lactones | moxidectine | 11                     | 3             |



2) Decreasing the probability that GIN meet host

#### Enhancing host defence capacities 1)

Vaccine development: not available at the commercial level

Right parasite antigens not yet identified due to complicated life cycles



### 1) Enhancing host defence capacities

<u>Feed</u>: immune process and mucosa repair need amino acids Therefore amino acid shortage may impair defence against GIN. Providing protein supply increase the host resistance/resilience Direct or indirect effects of secondary metabolites from some

local protein sources may impair GIN infection, egg

production or larval development (Tannins, Saponins...)

## 1) Enhancing host defence capacities



## 2) Decreasing the probability that GIN meet host through grazing management

#### Humid tropics:

Fast development of GIN free stages (1week from egg to infective larva)

Short survival of infective larvae in tropical conditions: <5%, 4 weeks after egg laying

L3 population peaks 2-3 weeks after egg laying (Aumont 1989, 1991)

Design of rotational grazing

1 week in, 4 to 5 weeks out (compromise with grass quality)

Allows avoiding the worse, but not enough for the best



Need pasture fencing or goat tethering

## 2) Decreasing the probability that GIN meet host through grazing management

Using GIN specificity

► Mixed grazing with Cattle (Horses, Geese...)

decrease in Goat stocking rate

associated species swallows and destroys Goat GIN infective larvae

Decrease in pasture contamination



### 2) Decreasing the probability that GIN meet host



## **3)** Reducing the use of synthetic drugs

Keeping non-AR GIN in refugia for limiting AR development

Using Targeted Selective Treatments alone (on the whole flock)

or in combination with strategic drenching and grazing management

Ex: using FAMACHA© on adult goat flock (refugia)

+ strategic treatments on kids

+ "leader follower" grazing design for weaned kids and adult goats (same GIN population for the whole farm)



Need suitable diagnostic tools and skilled farmers



2) Decreasing the probability that GIN meet host

### **Conclusion and perspectives**

Many ways for reducing the GIN impact are already available

To date, the challenge is to study interactions between the more promising ones

The next steps would be:

 ✓ building decision tools allowing farmers to manage sustainably GIN at the whole farm level

✓ designing a general model of GIN-host relationship

# Thanks for your attention

ALIMENTATION AGRICULTURE ENVIRONNEMENT

