THE DYNAMIC INTERPLAY BETWEEN PARASITES AND IMMUNITY IN SHEEP; DISCOVERING SIMPLICITY FROM COMPLEXITY

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“If you know the enemy and know yourself, you need not fear the result of a hundred battles. If you know yourself but not the enemy, for every victory gained you will also suffer a defeat.”

—SUN TZU
How does Haemonchus survive?

- Raise pH
- Produce chemicals that suppress immunity
- Mobility
- Blood Feeding
WHAT IS PARASITE RESISTANCE?

This is what “full host protection” looks like
Mechanism of Parasite Resistance

IL-4

CXCL1

MCP1

M2
WHAT IS THE EFFECT OF MACROPHAGES ON HAEMONCHUS?

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WHAT IS THE EFFECT OF MACROPHAGES ON HAEMONCHUS?
It is what macrophages produce that make them interesting.

For infection, monocytes are more prevalent in blood in St. Croix vs
It is the sum effect of these responses that eliminate larvae from St. Croix or parasite...
“In complexity there is no silver bullet only silver buckshot”

- MARC CABAJ
Simple concepts from complex interactions

- IL-4

Breed matters
Simple concepts from complex interactions

**Egg production per worm**

- Texel: 1.6 eggs/g per adult
- Suffolk: 2.9 eggs/g per adult
Utilizing FEC Breeding Values in Katahdin Sheep

Simple concepts from complex interactions
Simple concepts from complex interactions

So...

Rumen bypass
IL-13

May work as a novel treatment?
Simple concepts from complex interactions

Immunity requires energy and protein
Can we improve host immunity to parasites?
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