

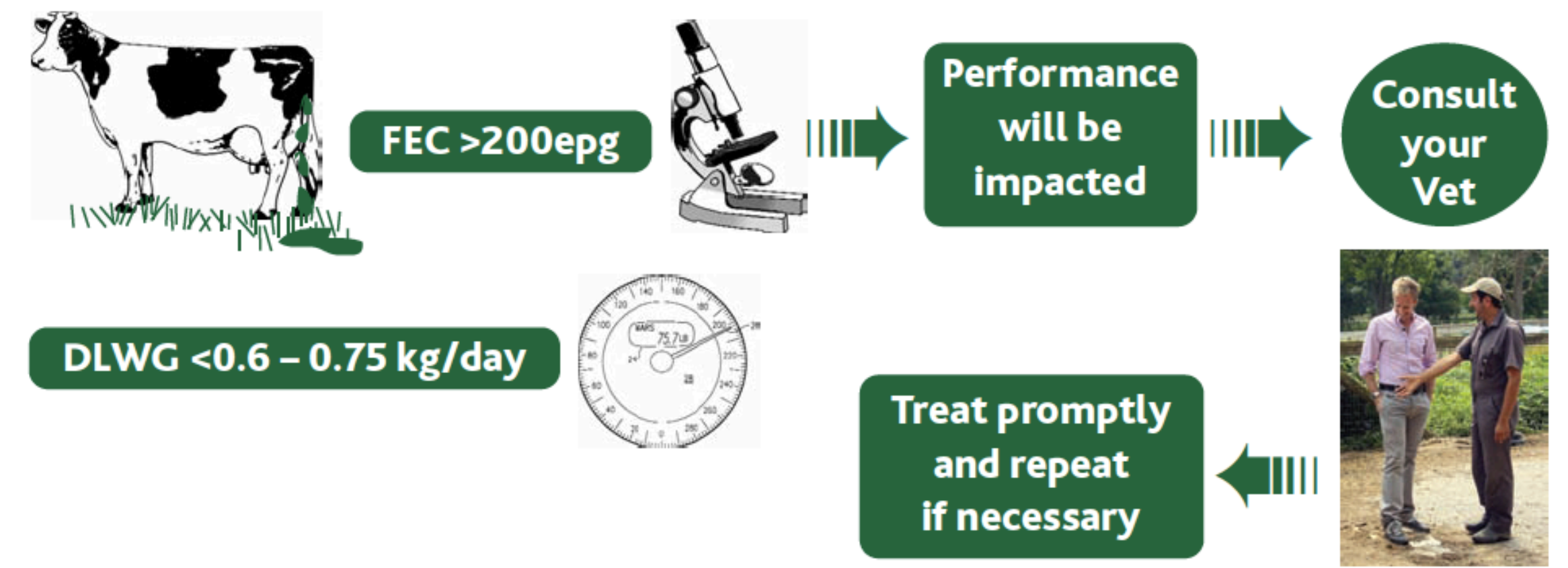
# Diagnosis before treatment: Identifying dairy farmers' determinants for the adoption of sustainable practices in worm control

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## Introduction

Gastrointestinal nematode (GIN) infections in cattle cause an important loss in production and animal welfare. These infections are being controlled by regular use of anthelmintics. The threat of **anthelmintic resistance** emphasizes the need for new, **sustainable control strategies** that depend on the **use of diagnostic methods** before implementing anthelmintic drugs preventively on the farm. In order to successfully translate these practices, we need to have a better understanding of the **underlying factors** that influence dairy farmers' **adoption** of parasitic diagnostic methods.

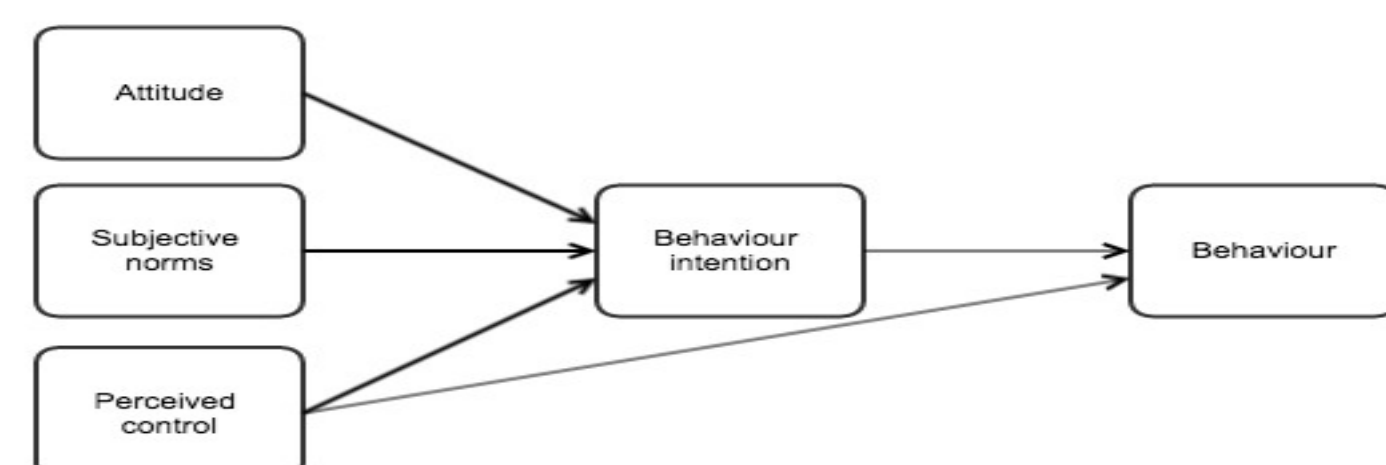


## Materials & Methods

### Theoretical framework

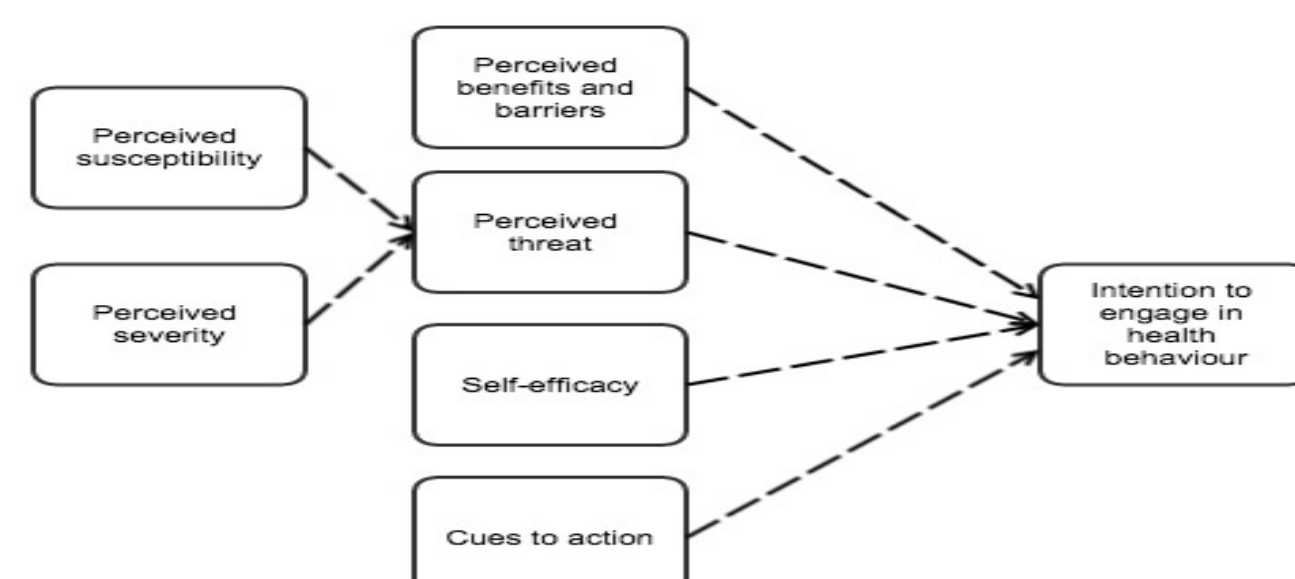
#### TPB

The Theory of Planned Behaviour (TPB): Socio-psychological theory to model human behaviour. Behaviour intention is regarded as the proximal determinant of actual behaviour (Ajzen, 1991).



#### HBM

The Health Belief Model (HBM): Psychological theory to predict behaviour-change in health-related topics (Rosenstock et al., 1988).



### Latent factors

#### TPB

- **Attitude towards diagnostics:** Positive or negative evaluation of using diagnostic methods before implementing anthelmintic drugs.
- **Subjective norm:** The perceived expectation of significant others in using diagnostic methods.
- **Perceived behaviour control:** Perception of the ability to perform a diagnostic test on the farm.

#### HBM

- **Attitude towards anthelmintics (Barrier):** Positive or negative evaluation of the preventive use of anthelmintic drugs.
- **Perceived susceptibility:** Perception of the exposure to anthelmintic resistance of GI nematodes on the farm.
- **Perceived severity:** Perception of the harm caused by anthelmintic resistance on animal health.

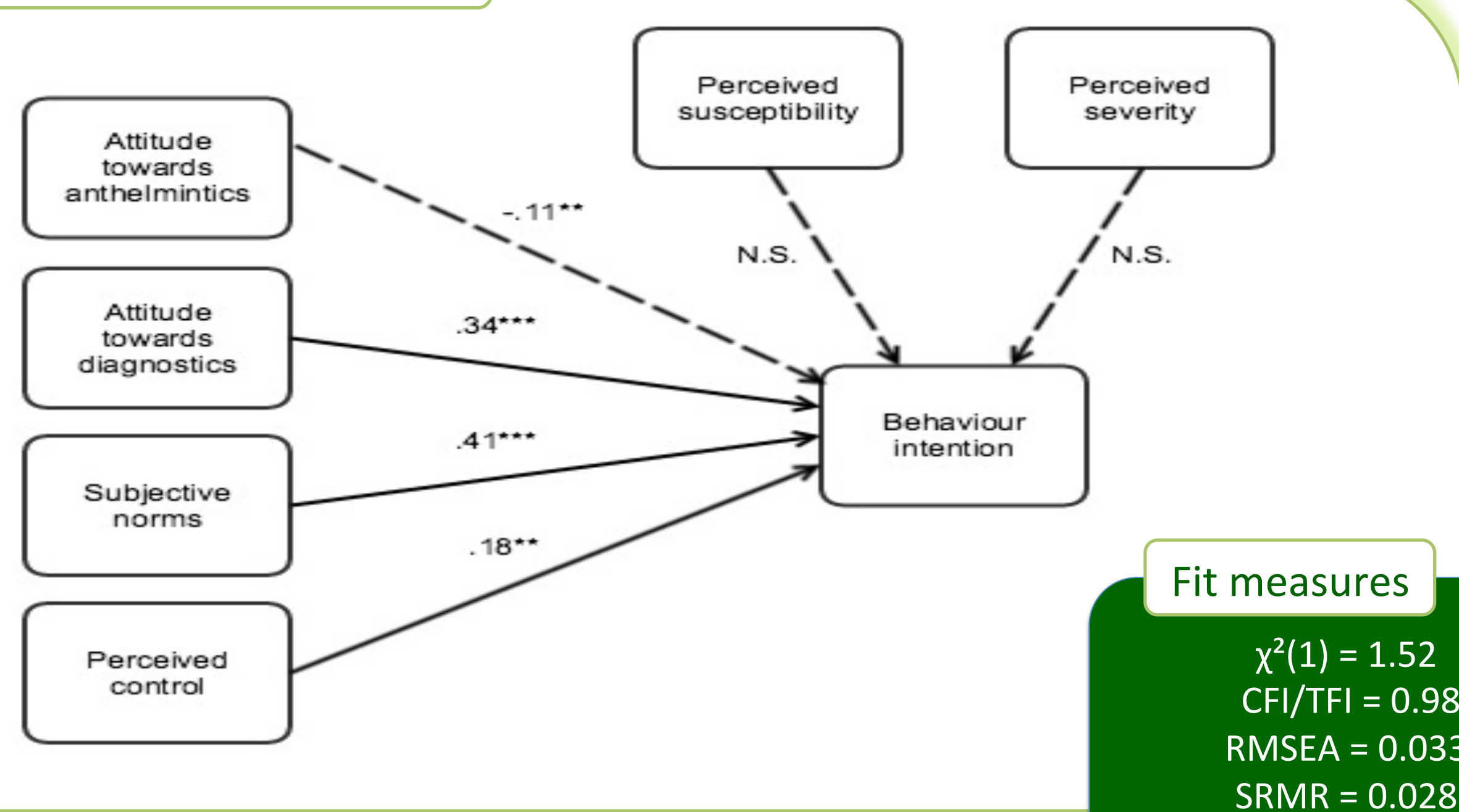
- **Behaviour intention:** The intention to adopt diagnostic methods before implementing anthelmintic drugs on the farm

### Survey design

- Cross-sectional survey, by post and by e-mail.
- Target population: dairy farmers in Flanders (Belgium), > 30 adult dairy cows (>24 months).
- Total of 574 completed surveys (29% response rate)
- Structural equation modeling for analysis

## Results

### Model



#### Fit measures

$\chi^2(1) = 1.52$   
CFI/TFI = 0.98  
RMSEA = 0.033  
SRMR = 0.028

### Multi-group comparison

#### Young stock

- Attitude towards anthelmintics was more positive for young stock (0.63,  $p < 0.001$ )
- Susceptibility was perceived higher for young stock (0.22,  $p < 0.05$ )

#### Adult dairy cows

- Attitude towards diagnostics was more positive for dairy cows (0.24,  $p < 0.05$ )

No significant differences were found in the regressions between the 2 groups

## Discussion

- 'Attitude towards diagnostics' and 'Subjective norm' present the largest effect on behaviour intention. The stronger the positive attitude for diagnostics and the perceived expectation of others, the more likely dairy farmers will adopt diagnostic methods on their farms.
- A positive attitude for the preventive use of anthelmintic drugs holds a negative effect on behaviour intention, and thus a significant barrier for the adoption of diagnostics.
- This positive attitude for anthelmintics indicates the drugs are still sufficiently effective, which may explain why the risk perception for anthelmintic resistance had no effect on behaviour intention..

## Conclusion

The insights presented in this study can be implemented in the development of communication strategies for the uptake of new, sustainable worm control practices. We suggest the message should cause a positive attitude towards diagnostics and contain a positive influence of significant others such as the veterinarian or opinion leaders in the dairy industry. This message will gain the strongest effect and best uptake of advice. The threat of anthelmintic resistance should be avoided.

## References

- Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*, 50, 179–211.
- Rosenstock, I. M., Strecher, V. J., & Becker, M. H. (1988). Social Learning Theory and the Health Belief Model. *Health Education & Behavior*, 15(2), 175–183.

