

# Farmers' knowledge and expectations of antimicrobial use and resistance are strongly related to usage in Dutch livestock sectors

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## Introduction

### Background

- Transmission of antimicrobial resistant bacteria from livestock into the environment and food chain is a public health concern
- Lowering on-farm AMU is considered the most logical intervention for containing the AMR threat originating from animals
- Besides technical farm interventions, behavioral interventions should be considered in One Health AMR action plans
- Evidence from human medicine relating psychological factors to potential misuse or overuse of antimicrobials is unequivocal



### Aims

- To characterize farmer's motivational and enabling factors towards AMU and AMR in three major animal production sectors
- To explore the impact of these psychological factors on their on-farm AMU

## Materials & Methods

- Farmer selection
- Cross-sectional online survey
- Exploratory Factor Analysis (EFA) on questionnaire items
- Linear regression model

### Main domains of the questionnaire:

Knowledge  
Risk perception  
Attitude  
Behavior

## Results

### Study sample of 457 farmers



73.5% (336)  
dairy farmers



16.2% (74)  
pig farmers



10.3% (47)  
veal farmers

Table 1 Results of the linear regression analysis of the motivational and enabling factors on AMU (standardized (log DDDA<sub>F</sub> + 1))

Psychological factors	$\beta$	SE	P
'Referent beliefs'	0.0526	0.0487	0.2806
'Perceived risk'	-0.0961	0.0509	0.0610
'Knowledge'	-0.1814	0.0513	0.0004
'Undesired attitude to regulations'	0.0961	0.0517	0.0636

Notes. Model statistics: F = 5.54, P = 0.0002, R<sup>2</sup> = 0.05. Psychological factors resulting from EFA. SE, standard error. Model assumptions were satisfied.

## Conclusions & Recommendations

- Farmers' knowledge and expectations, risk perception and attitude towards AMU and AMR affect on-farm AMU
- Psychological factors differ by livestock sector
- "Knowledge" was the most significant determinant inversely related to on-farm AMU across all sectors
- Knowledge of AMU and AMR and expectations of antimicrobial effectiveness should be heavily targeted in the communication with the veterinarian and through educational campaigns for farmers
- The importance of partnership-based communication and education of farmers when it comes to specific AMU knowledge, expectations and regulations must be stressed
- Farmers should be more actively involved in designing and evaluating policy regulations

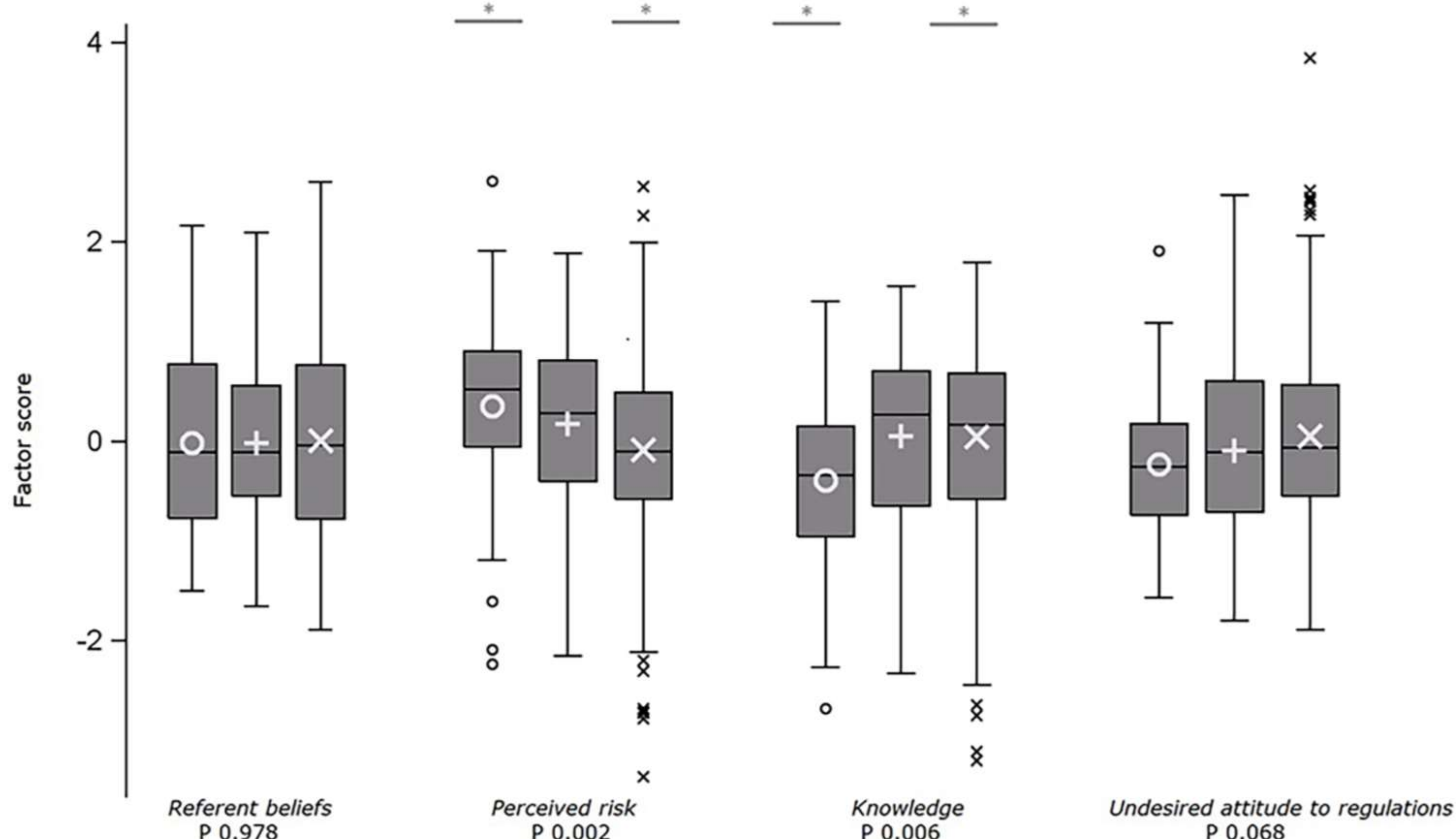


Fig 1 Factor scores in the 4 obtained factors by sector (o = veal farmers, + = pig farmers, x = dairy farmers), median, 10th, 25th, 75th, 90th percentiles, and outliers. An increase in scores of factor 1–4 indicate higher referent beliefs, increased risk perception, more knowledge or more disregard for antimicrobial regulations, respectively. P-values display the ANOVA outcomes comparing the mean factor scores per sector. Lines with an \* indicate which sector score means differed significantly at P < 0.05.