UNIVERSITY OF COPENHAGEN
DEPARTMENT OF VETERINARY AND ANIMAL SCIENCES

Factors associated with herd level antimicrobial use in Danish broilers

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OBJECTIVES

To quantify antimicrobial use in the Danish broiler production chain from 2015 to 2019, and to investigate associations between antimicrobial use, herd size, season and year

CONCLUSION

Antimicrobial use in the Danish broiler production chain was generally low in 2015-2019 with some year and season variations

MATERIALS & METHODS

- Register data on all veterinary prescriptions and herd information on all active broiler (conventional and organic), breeder pullet and breeder herds in 2015-2019
- Antimicrobial use quantified as Animal Daily Doses (ADD) per 1,000 birds per herd-month, dichotomised to antimicrobials used or not prior to modelling
- 17,927 herd-months across 238 conventional broiler herds, 32 organic broiler herds, 22 conventional breeder pullet herds and 47 conventional breeder herds
- Generalised logistic mixed models with herd as random effect

SUMMARY OF RESULTS

- The proportion of herds not using antimicrobials was highest in organic broiler herds (71.8%) and lowest in breeder pullet herds (13.6%)
- Median ADD per 1,000 birds per herd-month was highest in organic broiler herds (11,532) and lowest in breeder pullet herds (1,190)
- The probability of antimicrobial use in conventional broiler herds was associated with larger herd size, season and year, with interaction between season and year
- The probability of antimicrobial use was associated with season and year (significantly higher in 2015) in breeder herds and season in breeder pullet herds (significantly higher in Winter than Spring)
- Further research is needed to uncover the reasons behind differences in antimicrobial usage pattern between herd types

RESULTS

Antimicrobials were used in:
969 (5.4%) herd-months in 2015-2019

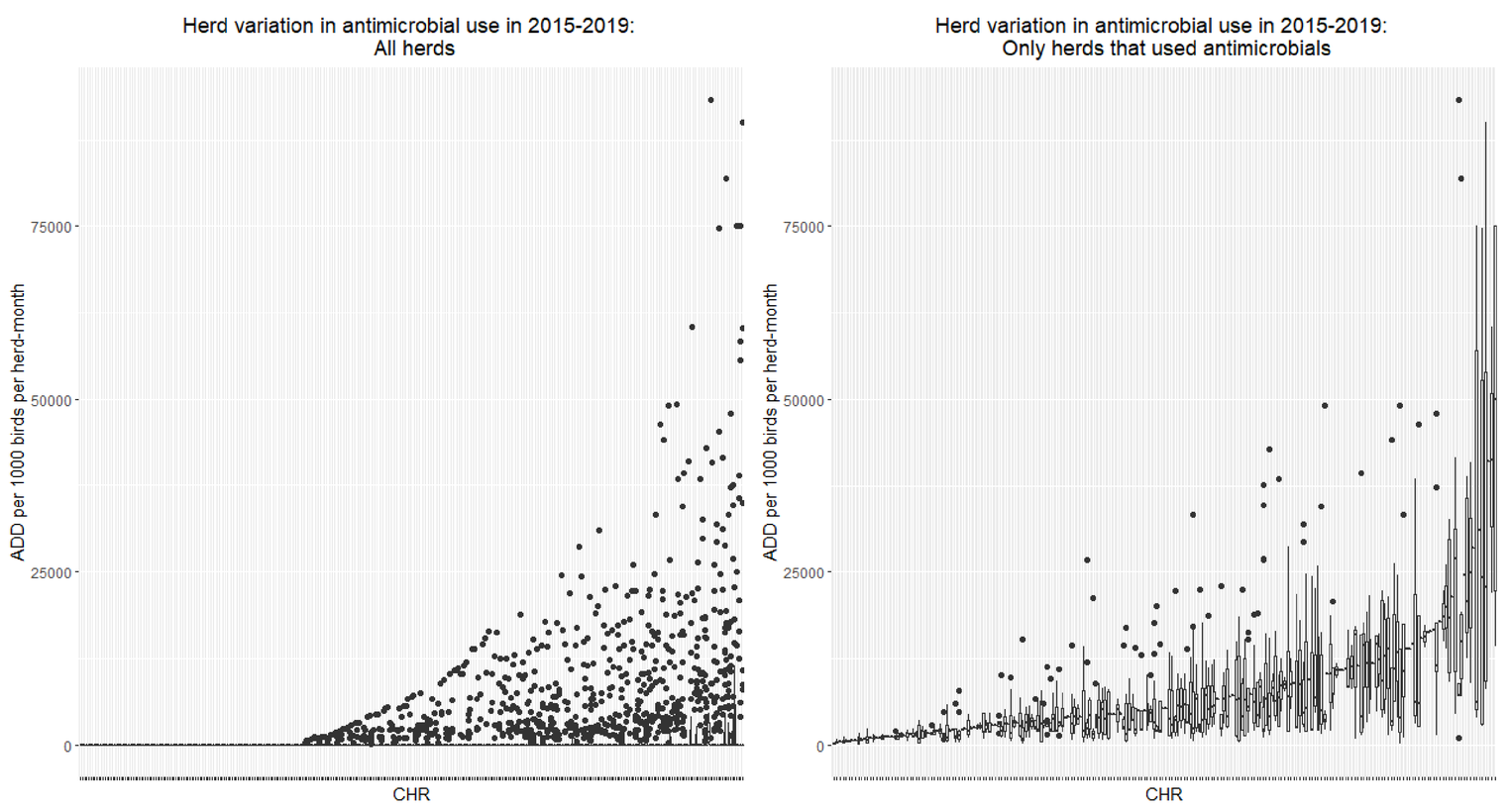
Herd type	n (herds)	n (herd-months)	Median ADD per 1,000 birds per herd-month in months where antimicrobials were used	% herds that did not use antimicrobials in 2015-2019
Conventional broiler herds	238	13,042	3,199	31.9%
Organic broiler herds	32	1,123	11,532	71.8%
Breeder pullet herds	22	1,174	1,190	13.6%
Breeder herds	47	2,587	6,818	36.2%

Breeder pullet herds, n=1,174

Random effects	Variance	St.dev.		
Herd (CHR)	1.126	1.061		
Fixed effects	**Estimate**	**OR**	**95% CI**	**Pr(>|z|)**
(Intercept)	-3.711	0.02	0.01-0.06	< 0.001
Summer	0.800	2.22	0.97-5.09	0.058
Autumn	0.735	2.09	0.91-4.80	0.084
Winter	0.957	2.60	1.15-5.87	0.021

Breeder herds, n=2,587

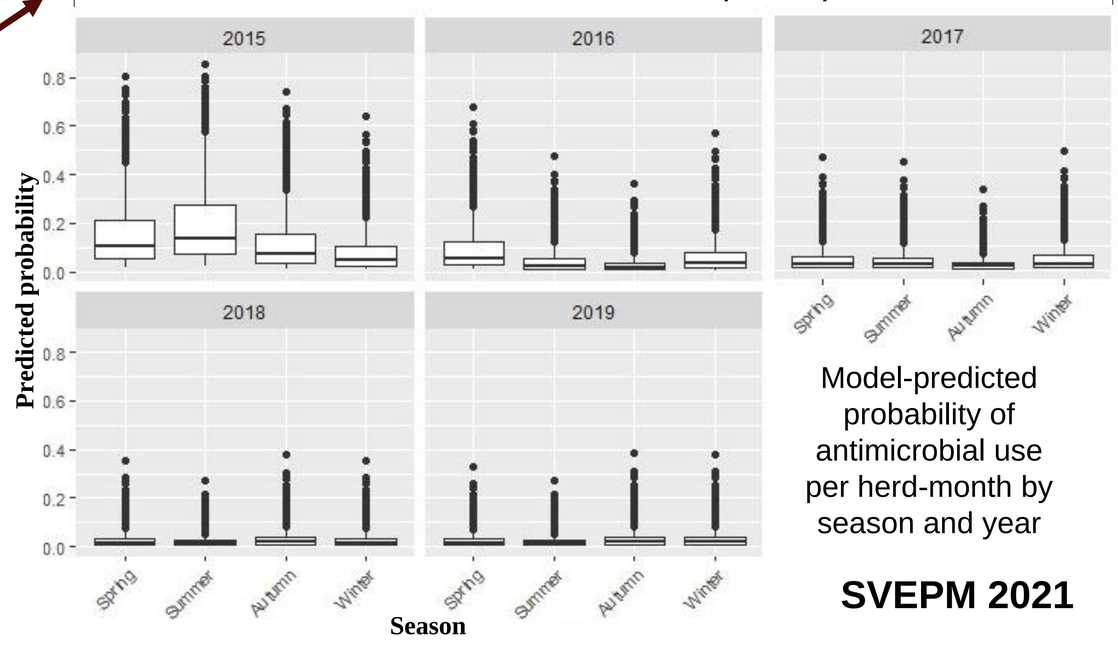
Random effects	Variance	St.dev.		
Herd (CHR)	1.696	1.302		
Fixed effects	**Estimate**	**OR**	**95% CI**	**Pr(>|z|)**
(Intercept)	-3.159	0.04	0.02-0.09	< 0.001
Summer	-0.209	0.81	0.43-1.53	0.519
Autumn	-0.211	0.81	0.43-1.53	0.515
Winter	0.498	1.64	0.94-2.88	0.081
2016	-0.726	0.48	0.27-0.87	0.014
2017	-2.184	0.11	0.05-0.28	< 0.001
2018	-1.201	0.30	0.16-0.58	< 0.001
2019	-0.822	0.44	0.24-0.79	0.006



Generalised logistic mixed effects model results

Organic broiler herds
n=1,123
No significant effects

Conventional broiler herds, n=13,042



Model-predicted probability of antimicrobial use per herd-month by season and year

SVEPM 2021

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