Factors associated with herd level antimicrobial use in Danish broilers

Lund, Vibe Pedersen; Thoefner, Ida; Nielsen, Liza Rosenbaum; Christensen, Jens Peter

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Factors associated with herd level antimicrobial use in Danish broilers

Vibe Pedersen Lund*, Ida Thøfner, Liza Rosenbaum Nielsen & Jens Peter Christensen

Department of Veterinary and Animal Sciences
Faculty of Health and Medical Sciences
University of Copenhagen, Denmark
*vibeplund@sund.ku.dk

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

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

<table>
<thead>
<tr>
<th>Hard type</th>
<th>n (herds)</th>
<th>n (herd-months)</th>
<th>Median ADD per 1,000 birds per herd-month in months where antimicrobials were used</th>
<th>% herds that did not use antimicrobials in 2015-2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional broiler herds</td>
<td>238</td>
<td>13,042</td>
<td>3.199</td>
<td>31.9%</td>
</tr>
<tr>
<td>Organic broiler herds</td>
<td>32</td>
<td>1,123</td>
<td>11.322</td>
<td>71.8%</td>
</tr>
<tr>
<td>Breeder pullet herds</td>
<td>22</td>
<td>1,174</td>
<td>1.100</td>
<td>12.6%</td>
</tr>
<tr>
<td>Breeder herds</td>
<td>42</td>
<td>2,587</td>
<td>8.118</td>
<td>32.2%</td>
</tr>
</tbody>
</table>

**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 0.056
Autumn 0.735 2.09 0.91-4.80 0.084
Winter 0.957 2.60 1.15-5.67 0.023

**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 -0.271 0.81 0.43-1.53 0.519
Winter -0.458 1.64 0.84-2.88 0.081
2016 -0.726 0.48 0.27-0.97 0.014
2017 -2.184 0.11 0.05-0.28 < 0.001
2018 -1.251 0.30 0.16-0.58 < 0.001
2019 -0.822 0.44 0.34-0.70 0.003

Generalised logistic mixed effects model results

**Conventional broiler herds, n=13,042**

Organic broiler herds n=1,123
No significant effects

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

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