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**Resistance of Escherichia coli in calves from different husbandry systems and age groups in Germany**

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**Abstract:**

**Background/Objective:** Antimicrobial resistance (AMR) in calves is influenced by many different factors, including age, management and antimicrobial use. It was the objective of this study to investigate, how the age, the husbandry system employed and the region influence the level of AMR of *Escherichia (E.) coli* in calves.

**Methods:** Faecal samples were collected from calves of defined age groups in four husbandry systems: 1. veal calves, 2. calves raised for beef production, 3. calves remaining in their dairy herd of origin and 4. suckler calves remaining in their herd of origin. Isolates of E. coli were tested against 15 antimicrobials using broth microdilution. The effect of age, husbandry system and region on AMR was investigated using McNemars test (for age pairs on farms) and logistic regression.

**Results:** Results indicated that age and husbandry system had a marked effect, with younger calves displaying a higher proportion of resistant isolates. Calves raised on specialized beef and veal farms displayed higher levels of AMR than those remaining on their farm of origin. Differences between beef and veal calves and between calves in dairy and in suckler herds, were only observed for some antimicrobials. Age related differences in AMR varied between husbandry types and antimicrobials. Prevalence of resistance in all populations tended to be higher in antimicrobials with a high level of AMR in the young calves. Finally, isolates from calves in larger herds showed a higher level of resistance than those from smaller herds.

**Conclusion:** Results call for a critical evaluation of trading of calves with respect to AMR and for further studies into factors influencing the persistence of AMR.

**Keywords:** calves, antimicrobial resistance, animal husbandry