

A Framework for Cost-Effectiveness Assessment of an Antimicrobial Treatment : Application to Colibacillosis in Broiler

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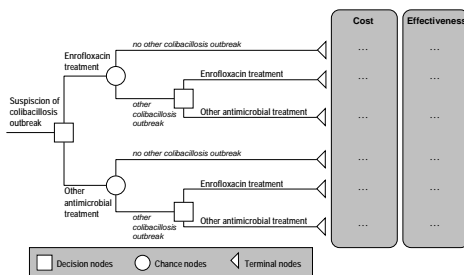
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Context and Objectives

- In poultry production, the use of fluoroquinolone is a matter of concern in connection with an increasing occurrence of fluoroquinolone-resistant *Campylobacter* infection in humans. As a fact, this bacteria is the most common cause of foodborne human gastroenteritis in Europe and poultry meat is considered as a major reservoir for human contamination. Beside expected favorable effects on public health, the limitation/banning of fluoroquinolone use in poultry might have unfavorable economical consequences for the producers.
- The aim of this poster is to present a framework for the assessment of the interest of using enrofloxacin to treat avian colibacillosis in broilers and discuss the main difficulties encountered when trying to implement this approach in field conditions.

Material and Methods

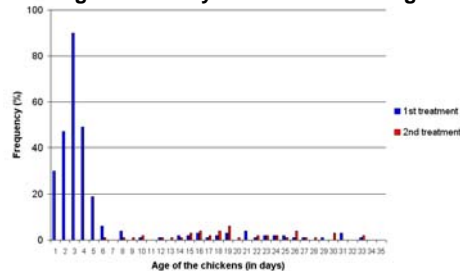
- A cost-effectiveness analysis was performed. This method involved three stages 1) the building of a decision tree to describe the different possible therapeutic strategies; 2) the collection of the data necessary to parameterize the decision tree; 3) and the solving of the decision tree.



- Data were collected to identify the most common therapeutic strategies, to evaluate the probability of reoccurrence of colibacillosis (chance nodes) and to assess the costs and effectiveness associated with the different therapeutic strategies
- The data were retrospectively collected from two producer organizations of Western France. The sample consists of 286 broiler batches experiencing one or more colibacillosis outbreaks. The total number of treatment studied amounted to 353.

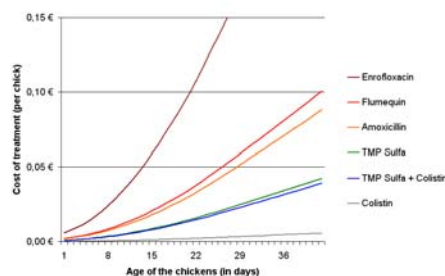
Implementation

Distribution of age at first day of treatment among broiler batches



Cost (treatment expenditures)

- Treatment expenditures do not seem *a priori* difficult to estimate.
- Prohibitive cost of enrofloxacin limits its use to the first days of rearing : quite no use after 7 days of age.



- For comparison purposes, study therefore focuses on batches where first treatment was initiated during the first week of rearing.

Chance nodes

- Problem of representativeness of collected data (poor diversity within organization practices)
- Problem solving by computing other data sources (observatory of antibiotic consumption)

Effectiveness

- Evaluation of technical and economic effects: food conversion rate, average daily gain, mortality rate, occurrence of other treatments (colibacillosis, enteritis, coccidiosis), condemnation rate.
- Strong link between organization and hatchery therefore strong interaction between E. coli strain/ pathogenicity and organization (rate of second treatment after first treatment with enrofloxacin varies according to hatchery and organization)
- Over representation of batches treated with enrofloxacin during the first days. Therefore need for matching the batches treated with other antibiotics than Enrofloxacin (n=30) to a sample of a batches treated with Enrofloxacin (n=30) according to strain of chicken, age at treatment, month in the year, density of chicken in the building.
- Batches treated with enrofloxacin within the first week were found to have a lower condemnation rate (0.75% vs 1.9%, p<0.05, T-test) and a lower occurrence rate of treatment against coccidiosis (0.1% vs 0.33%, p<0.05, Khi2).
- Need for data from other production organizations

Discussion/Conclusion

- The present study is still at an exploratory stage.
- Difficulties were found to be bound to the *ex post* type of data collecting.
- Overcoming of difficulties is be found through improvement of data collection (stratification of sampling).