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20) METHODS USED FOR THE CONTROL OF THE EFFICIENCY OF ANTICOCCIDIAL DRUGS

BENZONI G., GRASTILLEUR D.
EVIALIS INTERNATIONAL

Corresponding author : Didier Grastilleur e-mail : dgrastilleur@evialis.evls.net

ABSTRACT
Studies about periodic control of the efficiency of the anticoccidial products against coccidiosis, efficiency of new products.

INTRODUCTION
Coccidiosis is an old and recurrent problem for industrial poultry productions. Prevention is based on classical hygienic methods (litter quality, disinfection of the floor …) and chemical prevention by the use of authorised anticoccidial drugs.
The use of vaccines has recently developed but, though efficient, is still expensive and limited to gallus.
Chemical prevention is still the more commonly used one despite of its disadvantages (possibility of cross contamination, withdrawing period …). The number of possible drugs is more and more limited, even very limited for some productions and users have to develop methods in order to preserve the efficiency of the products (shuttle programs, quick change over). They also have to control the efficiency of the field programs by using methods such as oocysts count in the faeces at critical periods, control of the lesions, control of bodyweight …
Additionally, screenings can also be done at the experimental station to control the efficiency of the products against coccidies from the field or from lab collections. This method can also be used to screen new vegetal products recently appeared on the market.

R et D department of EVIALIS group main missions are : to keep “up to date” the technical resources of the group, to find and develop new methods for its own researches, to find and develop new solutions and new products for animal productions. Its facilities for poultry researches are :

- Four houses that can be used for the different productions (broilers, turkeys, ducks …).
- A house with 96 roosters for digestibility studies.
- A house with individual cages for digestibility studies and screenings for broilers.

- A house equipped with collective cages to study pathology in broilers, turkeys and ducks. At the beginning, it was created to study coccidiosis.
- Two houses for field trials and a network for field observations. It can also use the facilities of other French research centres.

MATERIALS AND METHODS

1. Protocol (broilers)– developed by EVIALIS twenty years ago.

- Materials :
  - Broilers : 360 chickens as hatched, one day old, allocated in 36 cages of 10 birds. Birds are individually identified.
  - House : its is equipped with 36 cages (1.42X0.46 m) with a grid floor. Temperatures and light program are the following ones.

Days	Temperature in °C	Length of the night
1	34	0
10	25	2 h
15	22	2 h 30
21	22	3 h
24	21	3 h 30
28	21	4 h

  - Diets: the same feed is used for the various diets. Anticoccidial products are mixed to this feed to realise the different diets. Conformity of the feed and of the dosage of the different anticoccidial products are controlled.
  - Coccidies : E. acervulina, maxima, tenella oocysts come from the INRA station at Nouzilly.

- Methods
  - Allocation of the birds : the birds are fed with the same feed until they are seven days old. Then, they are individually weighted and allocated to cages by a randomisation procedure that approximately equalise initial mean weights.
  - Inoculation : one control is not inoculated. Birds of the other groups are orally inoculated at 15 days with 150000 oocysts ofe E. acervulina, 10000 oocysts of E. maxima and 10000 oocysts of E. tenella. Its a mild inoculation which is adapted to the kind of products we are going to test. We have 12 groups : non treated non inoculated, non treated inoculated and then treated and inoculated; one of the group is treated with 100 ppm of monensin as a reference. Each treatment is repeated thrice.
  - Diets : birds are fed ad libitum with the same untreated feed up to 7 days and then with the experimental diet.
  - Birds are individually weighted at 7, 15, 21 and 28 days. Feed consumption is measured for each cage at the same ages. Weight gains and feed conversion rates are calculated.
  - Mortality et morbidity : la mortality is registered every day and morbidity is evaluated when the birds are weighted.
  - Lesion index : it is measured following the method of REID et JOHNSON on 3 birds per cage 6 days after inoculation in order to control the effectiveness of the contamination.
  - Oocystal count : at 21, 22, 23, et 28 days faeces are collected under the cages, kept in a solution of potassium bichromate and send to a vet lab in order to be counted.

The same method is used for turkeys with adaptation for the day when the birds are inoculated and, of course, the inoculum.

2. Protocol used for field trials (two houses) (turkeys).
   Its a very simple design which compares the results of two pens. Its is adapted to confirm the results obtained at the lab or to make pre trials.

- Materials : two houses of 1200 square meters each with the same equipment and located on the same farm. Comparison: two different diets.
- Methods :
  - Control of performances : a sample of birds is weighted every week. Weights of the birds and feed consumption at the end of the rearing period. Yield and % of condemnation at the slaughter house are also registered.
  - Mortality and morbidity.
  - Quality of the litter and consistency of the faeces.

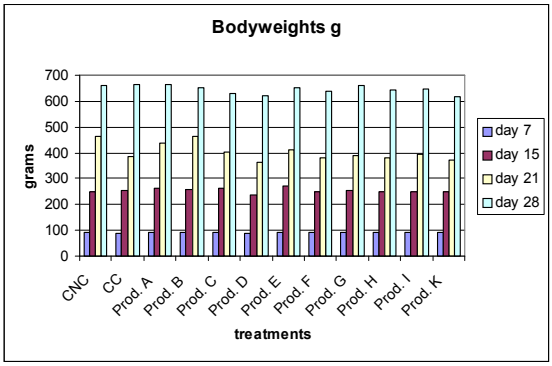
- Oocystal count at 28, 35, 42, 49, 56, 63, 70 et 77 days.
- No artificial contamination.

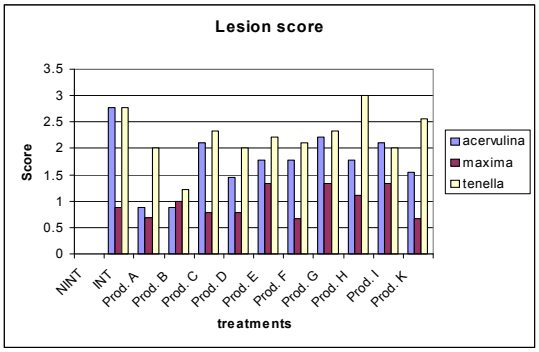
3. Large scale field trial.
They are made with a large number of birds as a last control for a product which has shown interesting properties at the steps before.

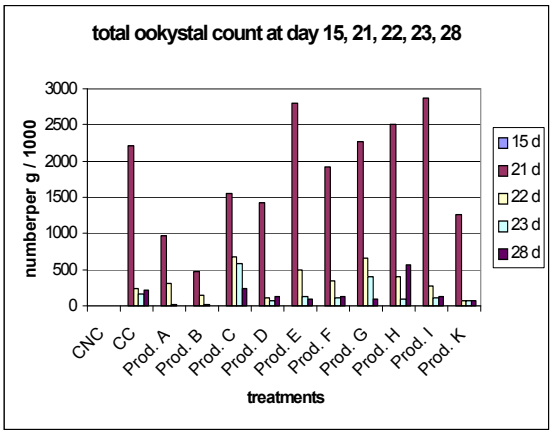
- Materials : the production of an organisation is divided into two groups. The only difference between the two groups is the kind of anticoccidial product added to the diet. The two populations are composed by the same strain of birds coming from the same hatchery.
- Methods :
  - The number of pens (repetitions) must be large enough.
  - Comparison : average of the technical and economical results for each group. Remarks about the behaviour for each group.

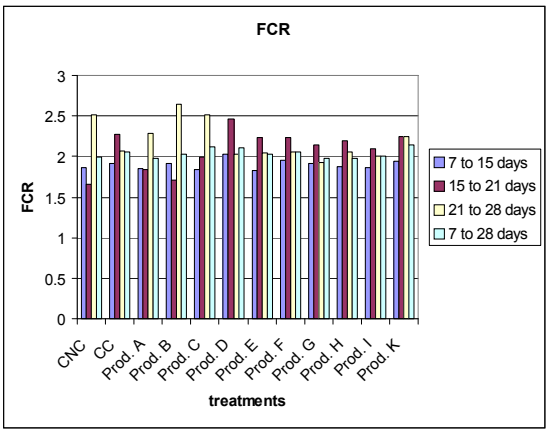
RESULTS AND DISCUSSION

1. Screening at the research station : the activities of 10 anticoccidial products are compared with a non treated and non inoculated control and with a contaminated non treated control. Product A is monensin at 100 ppm. Products from B to K are vegetal extracts.
   - Mortality : we have registered no abnormal mortality in this trial as the quantity of coccidies inoculated was rather low.
   - **Evolution of bodyweights : Evolution of feed conversion rate :**
   - **Evolution of the oocystal excretion (total) : Lesion score**









2. Field trial : the production is “poulet label” and the region is centre of France. The strain of birds used in this trial is T 457 N . The rearing conditions are the classical ones in France for free range label.
   - Two programs are compared :

	Control	Experimental
0 to 28 days	Robénidine	Robénidine
28 to 73 days	Monensin	Product B to be tested

   - Technical results :

Program	Numbers	Ages in d	Weights in kg	FCR	Mortality %
Control	103500	83.11	2.210	3.19	3.75
Exp	319100	83.09	2.154	3.17	2.82

CONCLUSION

Conclusion : the first trial shows that the method used here is well adapted to discriminate various products that can exhibit anticoccidial side effects. Product B has a strong anticoccidial effect even compared with monensin, taking into account that the artificial contamination was not very important and that there is less risk of recontamination as the birds are reared in cages.
The field trial confirms the possibility of using product B as an alternative to traditional anticoccidial product.

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