Area **Coccidia**

SETTING THE RECORD STRAIGHT ON VACCINATION AGAINST COCCIDIOSIS

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1 INTRODUCTION

Vaccination against coccidiosis in broilers has become an increasingly important part of a global prevention strategy against the disease. Not only it is an effective treatment against the clinical disease, but it also represents a clear improvement in zootechnical results when vaccines are rotated with classic anticoccidial programmes. There are several studies in HIPRA's **Area Coccidia** that show and explain these improvements.

- When chicken cycles are evaluated ante-vaccination (CAV), during vaccination (CDV) and post-vaccination (CPV), there is always a significant improvement in zootechnical parameters after the vaccination process. This positive evolution was shown in the initial tests with HIPRACOX® in northern Europe in a limited number of animals *(Area Coccidia: Zootechnical and economical evaluation of the use of a live anticoccidial vaccine in rotation with anticoccidial products in broilers chickens: results of a set of field trials from Belgium and the Netherlands; M. Dardi, M. De Gussem et al., 2012).* This tendency was subsequently confirmed with the compilation of Belgian field data in a study that included a total of 112 vaccinated batches and around 2,300,000 chickens *(Area Coccidia: The use of a live coccidiosis vaccine in rotation with anticoccidial feed additives: results from the Belgian field; S. Ronsmans, M. Dardi et al., 2013).*
- One of the reasons that explain this beneficial effect is the ability of the strains included in vaccines such as HIPRACOX® to restore the sensitivity of field strains of Eimeria to anti-coccidiosis additives. During the vaccination process, there is progressive replacement of wild strains by vaccine strains, thus changing the sensitivity profile of the oocyst population *(Area Coccidia: Anticoccidial Sensitivity Test (AST) results from a farm vaccinated for three consecutive flocks with a coccidiosis vaccine; M. Dardi, G. F. Mathis et al., 2013).*

Having acknowledged the benefits of the vaccines, poultry specialists and producers have several questions about their use, such as the best time of year to use them and the impact that can be expected on the vaccinated batches.

Indeed, the same questions appear to be asked regularly about the vaccination process:

a. -Can I vaccinate in the winter?

b. -Does vaccination involve more costs on medication?

c. -Should I expect poorer zootechnical results in the first vaccination cycles?

d. -Ultimately, will vaccination involve higher production costs?

2 MATERIALS AND METHOD

In order to answer these questions, data have been collected from a broiler production company in southern Spain (INASUR). The company completed a vaccine rotation cycle in the winter period (December 2013-March 2014). The data refer to a total of 11.8 million chickens, as follows:

Cycles ante-vaccination (CAV)
Programme: classic Shuttle
anti-coccidiosis
Total number: 3,623,943
Period: September-November 2013

Cycles during vaccination (CDV)
Programme: HIPRACOX®
Total number: 4,669,498
Period: December 2013-March 2014

Cycles post-vaccination
Programme: classic Shuttle
anti-coccidiosis
Total number: 3,685,488
Period: April-June 2014

3 RESULTS

The results largely answer the above questions.

a. Can I vaccinate in the winter?

The following table shows the zootechnical results of the herds. The weighted means of all the evaluated flocks in the above-mentioned periods were calculated.

Total chickens	Cycle	Period	Weight	% mort.	Days	ADG	FCR2,5*	EEI
3,623,946	CAV	September-November	2,880	4.48	47.26	60.95	1765.74	307.74
4,669,498	CDV	December-March	2,948	4.44	47.45	62.17	1754.52	312.25
3,685,468	CPV	April-June	2,926	5.42	46.84	62.48	1791.04	306.00

*The FCR was corrected to 2.5 kg using the following formula

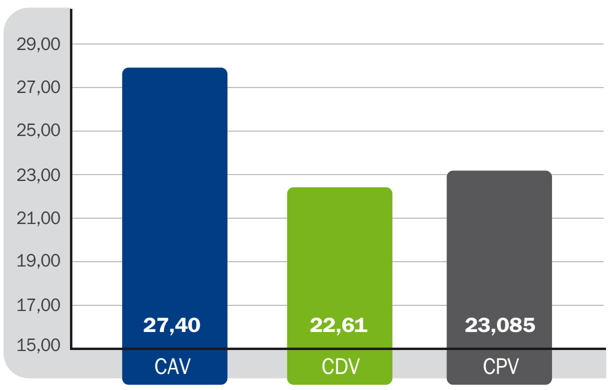
FCR2500 = FCR-Y, WHERE Y = (average weight at slaughter - 2,500) x 0.33

Vaccination completed from December to March had no negative impact on the main parameters compared with the flocks before and after vaccination. The mortality, average daily gain (ADG) and feed conversion rate (FCR) figures are better in vaccination cycles. The European efficiency index (EEI) was slightly higher during vaccination cycles, although the difference was not statistically significant.
The answer is that vaccination in winter had no negative impact on the results.

b. Does vaccination involve more costs on medication?

There has always been a widespread belief that, in the absence of a growth promoter, ionophores can control the digestive flora, particularly Gram-positive flora such as clostridium, thus minimising intestinal dysbiosis problems. The absence of these ionophores (due to the use of vaccines) could leave birds exposed to greater sensitivity to these problems and, in theory, the use of effective antibiotics against these pathogens could be more necessary.
Irrespective of the antibiotic power attributed to these ionophores (nearly always exaggerated), the field test shows that the use of antibiotics does not increase during vaccination cycles.
The chart shows the overall expenditure on antibiotics used per 1,000 chickens during the respective vaccination cycles.

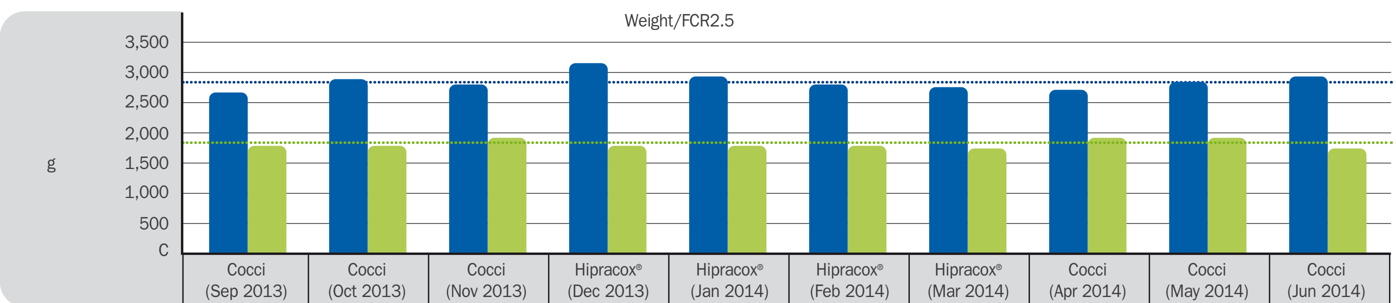
Medic./1000 chickens (€)



In this experience, the use of the vaccine did not increase the use of gastrointestinal or other medication. On the contrary, this concept presented an improvement (statistically significant) that persisted after vaccination.

c. Should I expect poorer zootechnical results in the first vaccination cycles?

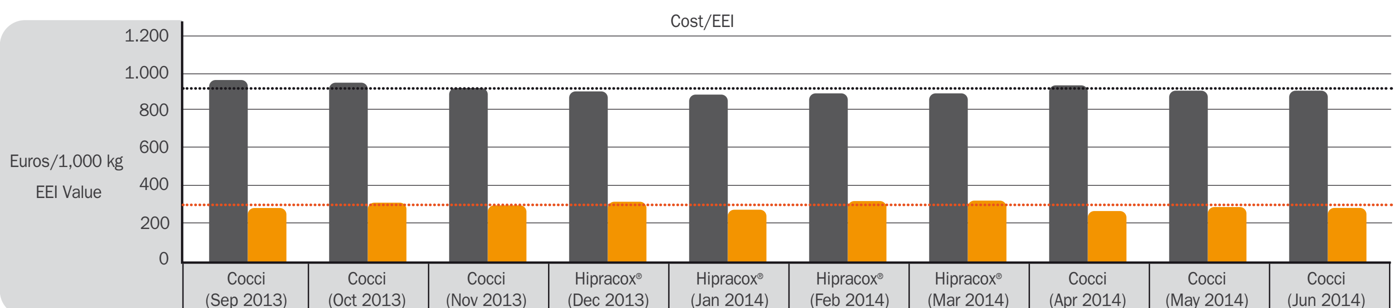
Following is a series of charts with the zootechnical results of the cycles ending in the different months of the study period.
The following chart shows final weight and corrected feed conversion to 2.5 kg. The line across the middle shows mean weight and conversion in both cases in all the cycles.



	Cocci (Sep 2013)	Cocci (Oct 2013)	Cocci (Nov 2013)	Hipracox® (Dec 2013)	Hipracox® (Jan 2014)	Hipracox® (Feb 2014)	Hipracox® (Mar 2014)	Cocci (Apr 2014)	Cocci (May 2014)	Cocci (Jun 2014)
Weight	2,781	2,942	2,910	3,042	2,944	2,911	2,901	2,858	2,926	2,987
FCR2.5	1.767	1.744	1.788	1.743	1.753	1.770	1.752	1.820	1.790	1.766

It can be seen that the parameter values were average or better than average (2,920/1.769) in all the months during the vaccination process. Even in the first month of use of HIPRACOX, the conversion index was numerically above average.

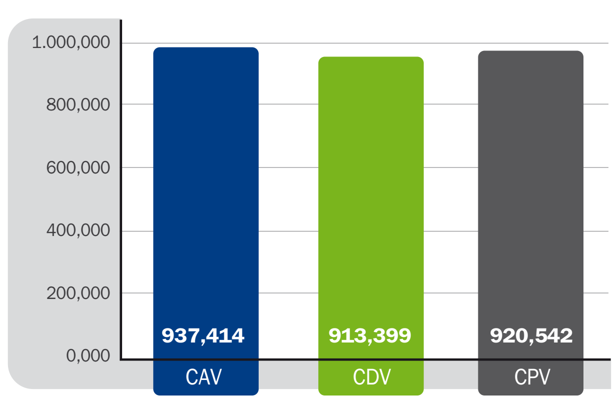
d. Will vaccination involve higher production costs?



	Cocci (Sep 2013)	Cocci (Oct 2013)	Cocci (Nov 2013)	Hipracox® (Dec 2013)	Hipracox® (Jan 2014)	Hipracox® (Feb 2014)	Hipracox® (Mar 2014)	Cocci (Apr 2014)	Cocci (May 2014)	Cocci (Jun 2014)
Cost/1,000 kg	956	934	923	916	911	915	912	924	920	918
EEI	303.83	311.03	308.01	316.58	299.95	317.21	316.13	297.59	303.50	315.39

In this study, production cost (euros/1,000 kg live weight) is always below average (€923) in the months with vaccination cycles. From the first cycle, there was a positive trend that persisted in all subsequent cycles. The cost includes the value of the vaccine given on the first day of life.
During the vaccination cycles, EEI values are average or above average (309).
In a weighted mean of the different periods, the resulting cost values are numerically better in cycles in which the vaccine was used.

Costs / 1,000 Kg



4 CONCLUSIONS

The decision to use vaccines against coccidiosis instead of and/or in rotation with coccidiostats should be based on technical and economic criteria, evaluating the times of year when infection pressure could be greatest or there could be factors predisposing to greater intestinal disequilibrium.

Although there may be more or less pre-established ideas about the best time of year for a vaccine rotation and certain "dogmas" concerning vaccination outcomes, this study has shown that the application of HIPRACOX®, even at an unusual time of year (winter), does not reduce zootechnical results. First vaccination cycles also do not reduce results compared with previous cycles.

All this shows that one cannot generalise about vaccination, the products to apply, or the best time to apply them, and that there should be no reduction in results in the first vaccination cycles.

The result of this study provides more information about how and when vaccines against coccidiosis should be used, suggesting that decisions about strategy and products should be based on in-depth know-how, as:

1º Not all vaccine products are the same. The degree of attenuation of the strains and the quantitative composition (number of oocysts) determine the degree and time of establishment of immunity.

2º Eimeria species included in the qualitative composition of vaccines play an essential role. Species such as *E. praecox*, located in the duodenum and with a synergic effect on pathogenicity when together with *E. acervulina*, play an essential role in the severity of subclinical cases of coccidiosis. Protection against these species is of the utmost importance.

3º Finally, thorough follow-up in the use of the vaccine and vaccinated flocks will ensure a good yield and improve knowledge of an increasingly common practice on poultry farms.

5 REFERENCES

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