The Value of Anticoccidials for Sustainable Poultry Production

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Outline

Disease : 6 slides

Legislation and Public Debate : 9 slides

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Coccidiosis : the disease

- Coccidiosis is a disease of universal importance in the poultry industry. The disease is estimated to cost 3 billions a year globally (1, 2). Studies indicated that 80% of that cost is linked to poor weight gain and increased feed conversion (2).

- Interruption of feeding and digestive process or nutrient absorption, dehydration, blood loss, loss of skin pigmentation and increased susceptibility to other disease agents (3).

  - Coccidiosis is largely a disease of young animals because immunity quickly develops after exposure and gives protection against later disease outbreak.

(1) Dalloul RA, Lillehoj HS. Poultry coccidiosis: recent advancements in control measures and vaccine development. Expert Rev Vaccines 2006;5:143–63. doi:10.1586/14760584.5.1.143)

(2) Williams RB. A compartmentalised model for the estimation of the cost of coccidiosis to the world's chicken production industry. Int J Parasitol 1999;29:1209–29.

(3) Yegani M, Korver DR. Factors Affecting Intestinal Health in Poultry. Poult Sci 2008;87:2052–63

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Coccidiosis : the disease

- Coccidia multiply and destroy intestinal cells, leading to
  - Clinical disease
  - Increased risk of microbial imbalance and pathogen proliferation (including *C. perfringens*)
  - Loss of intestinal integrity

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[1] Hoerr, F. Intestinal integrity and the impact of losing it. *World Poultry*, 17 (7), 2001.

Eimeria tenella – gross lesions

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Eimeria acervulina – gross lesions

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Coccidiosis : the disease

3 categories of solutions

- Prevention coccidiosis through anticoccidial products in feeds
- Live vaccines
- Control coccidiosis through treatment products either in feed or water

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Legislation on anticoccidials

In the EU, anticoccidials as feed additives are regulated under the feed additive regulation

- Feed additives - Regulation 1831/2003
- Coccidiostats and Histomonostats

This is different from medicated feeds and veterinary medicinal products (VMPs)

- Regulation 2004/28 (under review)
- Directive 90/167 (under review)

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Why are anticoccidials feed additives and not veterinary medicines ?

Of note

- Anticoccidials have obtained feed additive registrations ONLY in species where coccidiosis is **systematic** for biological and zootechnical reasons
  - poultry
  - rabbit
- In species where coccidiosis is NOT systematic, they are registered as veterinary medicines
  - i.e. cattle
- The European legislator has estimated that due to the **systematic** nature of the disease in some species, no diagnosis was needed therefore **no prescription was necessary** e.g. feed additive status

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What are the legal possibilities of changing the status of anticoccidials ?

Today, none

- The current legislation on feed additives remains Regulation 1831/2003
  - The revision of the veterinary medicine directive **cannot modify** or alter the legal framework of feed additives, regulation 1831/2003

- However, the European Commission has recently started work on the revision of 1831/2003
  - A consultation on what needs to be revised will be launched at the end of this year according to the Roadmap proposed by the European Commission
  - The Roadmap indicates clearly that the Commission will request comments in order to improve the current regulation, in particular the regulatory process
  - It is our information that the Commission does NOT intend to propose a revision of the status of anticoccidials
  - However, it is fair to predict that some stakeholders will insist on a change of status. Some have already (Federation of European Veterinarians – FVE)
  - Therefore an active participation of the poultry industry in the consultation process of the Commission is highly desirable

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Threats to anticoccidials

Move to Vet legislation – ‘FVE believes that all coccidiostats should be under veterinary prescription’

- Product availability could be compromised as under the VMP regulations there would be new manufacturing and regulatory requirements (passage from feed grade status to pharmaceutical grade)
  - Impact on international competition ability
- The potential ban of prevention in the new medicated feed legislation would in effect eliminate anticoccidials
- They would need to be prescribed at close time intervals
  - Possibly as often as every other week
- The feed additive regulation does not provide possibility to use anticoccidials off label or in underdosing. Veterinary prescribing would lead to that possibility

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Threats to anticoccidials

Move to Vet legislation – ‘FVE believes that all coccidiostats should be under veterinary prescription’

- FVE argues for lack of control of residues but…..
  - All feed industry under quality control HACCP
  - No possibility for off-label use i.e. variability of dosing and timing
  - Feed mills inspections
  - Limits for cross-contamination are established in the EU
  - EFSA report shows very low rate of excessive residues due to anticoccidials
    - 72 500 poultry samples controlled in 2016 in the EU, 18 non compliant for anticoccidials (1)

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(1) Chemicals in food 2016, EFSA

Threats to anticoccidials

Move to Vet legislation – ‘FVE believes that all coccidiostats should be under veterinary prescription’

- FVE argues on coccidial resistance but….
  - The products are still used successfully after half a century
  - There is no management issue

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Anticoccidials

Ionophores and Chemicals

- There are 2 types of anticoccidials – IONOPHORES (fermentation products) & Chemicals (synthetic products)
- IONOPHORES are animal-only antimicrobials that are used as antiparasitics against specific microscopic parasites. They are part of the solution to fight antibiotic resistance in animal and human health
- IONOPHORES are UNIQUE as they are Animal-Only Antimicrobials – not used in human medicine
- IONOPHORES' mode of action is UNIQUE and different to all other antimicrobials and shared class therapeutic antibiotics

This explains why no transmissible **resistance** has been identified in foodborne bacteria

Ionophores are part of the solution to fight antibiotic resistance in animal and human health

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Threats to anticoccidials

Bacterial resistance

- Ionophore anticoccidials are not active against most food-borne bacteria that are of concern in poultry production i.e. *E. coli*, *Salmonella* and *Campylobacter spp.*
- Ionophores anticoccidials are not used in human medicine – they are not on the WHO critical list (1) and are not medically important.
- Their mode of action is unique and today no transmissible genetic resistance has been identified

(1) Critically important antimicrobials for human medicine – 5th rev. Geneva: World Health Organization; 2017

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Classification of ionophores

- The World Health Organization has defined medically important (also called critically important) antimicrobials
  - Ionophores are not included (1)
- The World Animal Health Organization (OIE) had not included ionophores in their global database survey on antibiotic use
- The European Surveillance program of veterinary antibiotics (ESVAC) has not included ionophores on their data collection program (2)
  - « Not a public health issue»

(1) Critically important antimicrobials for human medicine – 5th rev. Geneva: World Health Organization; 2017.
(2) European Medicines Agency, European Surveillance of Veterinary Antimicrobial Consumption, 2016. 'Sales of veterinary antimicrobial agents in 29 European countries in 2014'. (EMA/61769/2016).

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The value of anticoccidials – Sustainability

Birds suffering of a loss of Intestinal integrity require +6% more renewable resources

Losing Intestinal Integrity will lead to a 6% higher Carbon Footprint or + 0.7M ton of Carbon. This is equivalent to 14.400 cars/year in Europe.

Broiler performance under coccidia challenge with or without anticoccidial program

To produce the same 1 kg of conventional chicken with a …	Good Intestinal Integrity	Poor Intestinal Integrity
Av. FCR	1.62	1,71
Quantity of feed to produce 6B birds (EU broiler production)	24.3 M tons	25,65 M tons
Carbon footprint Impact (CO^2 equivalent)	12.65 M tons	13,37 M tons

1. McElroy_2006_Virginia_Tech_Coban_Maxiban_Trial_VTE0602
2. Eckman 2001: Monteban versus Coccivac-B
3. Clavé H., Van der Horst F. – Essai de comparaison de différentes préventions anticoccidiennes chez le poulet label à chair jaune – Sciences et Techniques Avicoles – April 2004 – N° 47
4. Gaucher M.L.et Al – Impact of a drug free program on broiler chicken growth performances, gut health, Clostridium perfringens and Campylobacter jejuni occurrences at the farm level, 2015, Poultry Science, 94, 1791-1801

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The value of anticoccidials – Welfare value

- There is a critical link between animal health and good welfare
- A loss of Intestinal Integrity provokes enteritis. Birds are sick and drink more to compensate. Wet litter appears in the house (1).

- Wet litter is very aggressive for the birds footpad, which leads to footpad lesions and dirty birds, but also hock burns, breast blisters, malnutrition (1)
- Recent research has indicated also the potential for corneal burns and airsacculatis when anticoccidials are not used (2)

(1) Dunlop MW, Moss AF, Groves PJ, Wilkinson SJ, Stuetz RM, Selle PH. The multidimensional causal factors of “wet litter” in chicken-meat production. Sci Total Environ 2016;562:766–76. doi:10.1016/j.scitotenv.2016.03.147
(2) Salois M, Watkins K, Baker K, Karavolias J. The impact of antibiotic-free production on broiler health. Abstr. 2017 Int. Poult. Sci. Forum, Atlanta, Georgia: 2017.

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The value of anticoccidials – Food safety

- Loss of Intestinal Integrity has an impact on broiler cleanliness at plant arrival and further carcass contamination
- Loss of Intestinal Integrity has an Impact on bird's uniformity
- Cleanliness of broilers at plant arrival has an impact on food safety

- Compromised Intestinal Integrity may lead to increased food pathogen load due to:
  - Reduced intestinal strength, which increases leakage/rupture of the intestine during the slaughtering process
  - Reduced uniformity, which increases processing errors like cut or torn intestines due to birds being outside the "calibrated size"
  - Live broilers contain more faecal material on the outside and are more dirty due to wet letter during grow-out.

Personal communication S. F. Bilgili, PhD. Department of Poultry ScienceAuburn University, AL 36849-5416 USA; Elanco European VIV meeting Amsterdam 2003

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The value of anticoccidials – use of antibiotics

- A 2010 European market research showed that 43% of broiler flocks had enteritis, wet litter or coccidiosis concerns in the late phase (post 28 days of age)[1]
- In more than 50% of the cases, birds were treated with antibiotics, the remaining flocks were not treated
- Presence of wet litter in a flock increases by 61% the use of digestive antibiotics (+0.75 treatments)[2]
- Protecting Intestinal Integrity reduces the enteritis risk and subsequently the number of digestive treatments (- 1.19 antibiotic treatments)[2]

1 BEGIA Study, 2010.
2 Saggiorato M. et Al. – Can we predict early the performance of a broiler flock? Experience from Clostridium FirstTest – XIIIth European Poultry Conference – Tours, 2010.

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Summary

Ionophore anticoccidials

- Should remain as feed additives
- IONOPHORES are UNIQUE as they are **Animal-Only** antimicrobials not used in human medicine and do not contribute to shared class therapeutic antibiotic resistance
- Control coccidiosis
- Maintain intestinal integrity
- Contribute to sustainable poultry production
  - Economically
  - Environmentally
  - Health and welfare

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Key Messages

Anticoccidials should remain in the feed additive legislation in the EU

Anticoccidials should NOT be considered as antibiotics for the purpose of private quality schemes

Anticoccidials bring some very sizable benefits in terms of animal welfare, animal health, food safety and sustainability.

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Nature Comment

"Anticoccidial medicines……do not drive bacterial resistance in humans or other animals"

Marc Mendelson, Nature, Vol. 545, 4 May 2017, p.24

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Additional information

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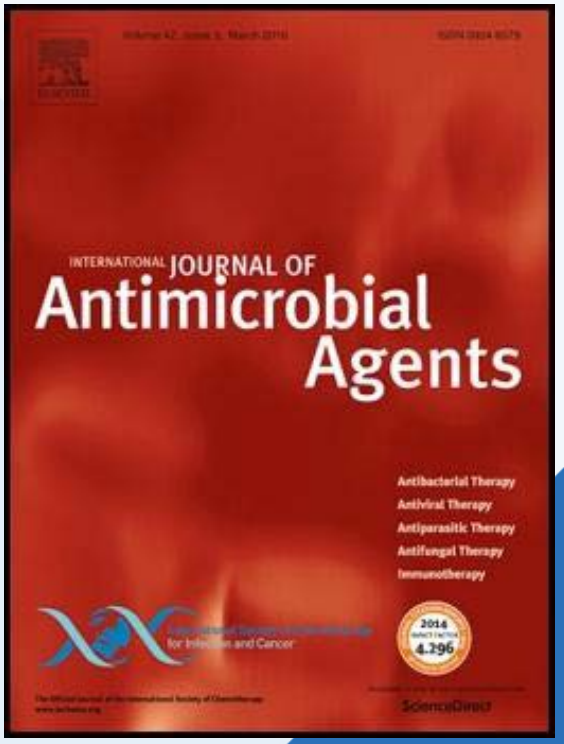

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