

Microbiological Competition as Complementary Intervention to Combat Poultry Colonization with Pathogens at Primary Production

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In primary production, a multilevel intervention strategy would be optimal with sequential intervention approaches aimed at different events in the infection cycle. One of these approaches is to reduce the susceptibility of the flock to infections by food additives and water. Feed additives may include chemical additives such as organic acids and biological agents used in the concept of competitive exclusion (EC). Competitive exclusion uses defined cultures or undefined microorganisms from healthy poultry intestines to prevent pathogens from subsequently occupying their specific niche. So, it is a concept that exploits bacterial antagonism to reduce the intestinal colonization of animals by pathogenic microorganisms. A double competition can operate in the gastrointestinal tract, that is, a competition for nutrients and adhesion sites. In addition, CE bacterial formulations may have an antimicrobial effect directed by the production of lactic acid, volatile fatty acid, hydrogen peroxide (H₂O₂) or bacteriocins. Another microbiological intervention to combat colonization of poultry intestines with pathogens in primary production is the use of acidifying bacteria. As we know, these bacteria, particularly lactic acid bacteria (LAB), contribute for several thousand years to preserve food. It has been suggested that the inhibitory effect of these bacteria on bacterial growth could be mainly explained by the production of organic acids, with the consequent reduction in pH, the acid dissociation stage which is an essential factor for the antagonistic effect. In addition to the bactericidal activity of H₂O₂ and bacteriocins that can help inhibit the growth of pathogens. Probiotics are the third strategy used against pathogens in primary production, the use of specific probiotics has proven to be an effective means to manipulate or manage the composition of the microbial population in the gastrointestinal tract of poultry, therefore protect poultry farms from pathogenic bacteria. Probiotics are compositions that contain one or more well-defined strains. Several descriptions have been proposed for probiotics, but they can be defined globally as living microorganisms that, once ingested, positively influence the host animal by improving its microbial balance. The main characteristics and functions that are expected for an efficient probiotic strain in poultry production include the maintenance of normal intestinal microflora due to competitive exclusion and antagonism, the alteration of metabolism by increasing the activity of digestive enzymes, improving food intake and digestion, and stimulating the immune system. Prebiotics can also be used in poultry production together with probiotics, prebiotics are defined as poorly digestible food ingredients, which positively influence hosts by selectively stimulating the growth and/or activity of one or a limited number of bacteria in the colon. Combinations of prebiotics and probiotics are known as synbiotics and may have antimicrobial activity. Therefore, the survival and development of the probiotic organism could be improved, since its specific substrate is readily available. It is believed that on farm combat of pathogenic bacteria is the key point of strategic control, since the host intestine is the only point of amplification in the food chain.

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