Sociedad Argentina de Microbiología General

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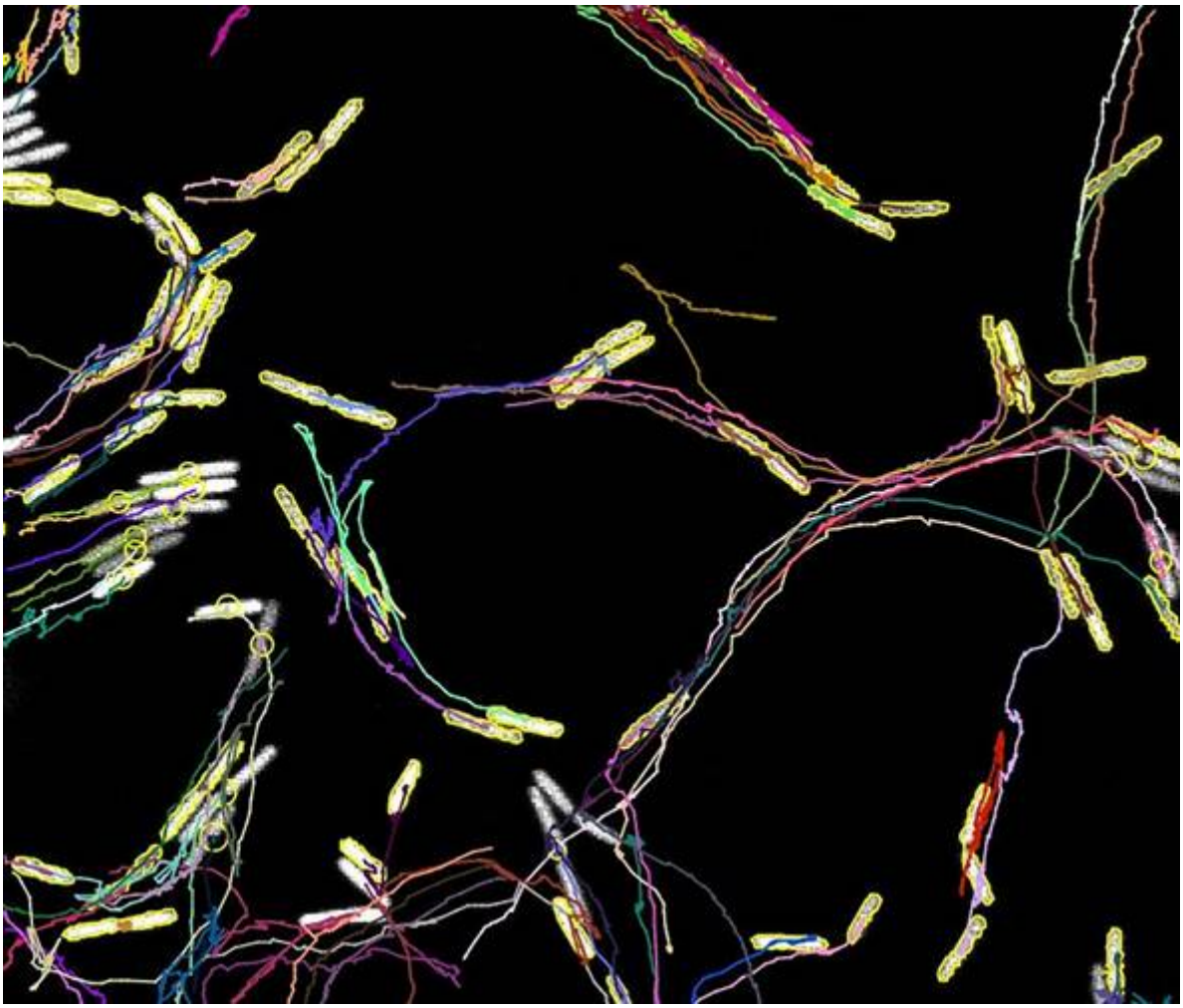

Foto: Se hace camino al andar. Celeste Dea. 1er puesto. Concurso fotográfico SAMIGE 20 años.

EFFECT OF PROBIOTIC AND SYNBIOTIC SUPPLEMENTS ON NUTRITION, HEALTH, AND PRODUCTION OF BROILER CHICKENS

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The poultry industry provides a significant fraction of components to the human diet. For decades, sub-therapeutic doses of antibiotics have been used to control intestinal microbial development, prevent infectious diseases, and achieve rapid growth in animals. Given that their use is prohibited in many countries, including Argentina, alternatives have been sought. This has boosted the development of multifunctional probiotic supplements, prebiotics, and their combination (synbiotics). Thus, this work aimed to evaluate the effects of multi-strain probiotic supplementation (Enterococcus faecium CRL1385, Ligilactobacillus salivarius CRL 1384, Lactobacillus crispatus CRL 1453, L. johnsonii CRL 1452, and Acidipropionibacterium acidipropionici LET 107) and/or synbiotic administration (1.5% oligofructose plus probiotic) during broiler rearing. The probiotic and synbiotic were sprayed on the feed (final dose 2 × 107 CFU/g). A total of 150 one-day-old male chicks (Arbor Acres plus) were randomized assigned to five treatments: 1) probiotic supplementation throughout the four feeding periods [super-BB (0-7 d), pre-starter (7-14 d), starter (14-28 d), and finisher (28-42 d)]; 2) probiotic administration up to and including 3th feeding period, and then continues without additive; 3) and 4) groups with the same scheme than treatments 1 and 2, but supplemented with synbiotic; and 5) control without any dietary supplementation. Chickens had ad libitum access to drinking water and feed. Samples were taken during the feeding changes to evaluate safety, animal development, feed conversion, intestinal maturation, microbiota, and production of organic acids. Biochemical parameters and muscle protein levels were also studied. Birds that received any of these supplements showed a healthy state without mortality, and significant increases in body weight and feed conversion compared to the control and standard values for this breed. An increase in villi length and crypts depth was observed in the gut of birds administered supplemented feed, favoring nutrient absorption and weight gain. Ca, Mg, and P increased in plasma during supplementation, demonstrating their mobilization to

key tissues such as bone and muscle. The intestinal microbiota normal balance was favored by an increase in the genera that produce organic acids that could inhibit the development of opportunistic pathogens. Consequently, there was no evidence of the presence of pathogenic microorganisms in the intestine nor translocation of microbiota to the liver and spleen. In addition, an increase of protein content in the breasts of chicken from probiotic group respect to the control group was detected. This adds nutritional value to one of the most consumed products by the population in our country. In conclusion, the results obtained constitute a step ahead in generating efficient natural alternatives for poultry farming with a favorable impact on health, nutrition, and production.

Palabras clave: feed additive – diet – broiler – probiotic - synbiotic