AVIAN PROBIOTIC AVI-CULTURE-2™ REDUCES NEONATAL MORTALITY AND HELPS TO IMPROVE BREEDING PERFORMANCE ©DGTDVM-2012

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The study was conducted during the 2012 breeding season in a flock of color canaries in Italy. Birds were housed in a room of 9 meters x 5 meters, reared in battery cages of 60 cm x 35 cm x 35 cm, with a conditioned microclimate to start reproduction by increasing the photoperiod. Diet consisted of a mixture of seeds and a soft-food prepared with boiled eggs, couscous, peas and sprouted seeds.

Two groups of 8 nestlings each were created, one group was labeled as P-Group, was treated with specific avian probiotic, AVICULTURE-2™ containing mainly Gram + bacilli) and the second group did not receive any probiotic whatsoever. This untreated group was labeled as C-Group and was used as a control group (fig. 1).

Figure 1.

Each of the nestlings were assessed using the following parameters:

• Weight gain (fig. 2)

• Drop consistency and features

• Intestinal flora up to day 7, 14 and 28.

Figure 2.

The intestinal bacterial flora was evaluated both by smear subjected to Gram staining and by culture on an Enterobacteriaceae selective medium. All nestlings were fed by their parents and they also received additional hand rearing food twice a day, morning and evening, since the first day of life up to the seventh day (fig. 3).

Figure 3.

The hand rearing food of the P-group was also contained the avian probiotic AVICULTURE-2™ (fig. 4), while the hand rearing food of the C-group contained no probiotics whatsoever.

Figure 4.

Drop consistency was assessed by FCS (Fecal Condition Score) (Todisco G., 2008) (Table 1).

SCORE	CONSISTENCY
1	hard, dry, crumbly
1.5	hard, dry
2	well formed, if picked up doesn't leave any print
2.5	formed with a moist surface, if picked up it leaves a small print
3	wet, poorly preserved form, if picked up it leaves a large print
3.5	very wet, but it still retain a definite shape
4	predominant loss of shape and consistency
4.5	complete loss of shape, consistency maintained only in little areas
5	Aqueous

Tab. 1: Fecal Condition Score. Normal values from 2.5 to 3.5 according to the foods given.

For laboratory bacteriological tests aseptically taken stool samples have been used and to collect stool samples sterile swabs directly from the cloaca were used. The swab was first smeared on a glass slide (fig. 5) and then transferred to the laboratory (fig. 6) for the sowing on specific medium for the Enterobacteriaceae cultivation (fig. 7). The slides were subjected to Gram stain. The slides of day 7 of the P-group showed the presence of several Gram + bacilli, a small amount of yeasts and almost no Gram- bacteria. In C-group, however, the bacterial flora was evenly distributed between Gram + and Gram - bacteria, bacilli and cocci. On slides of day 14 and day 28 of P-group always prevailed Gram +, but it was also stated the presence of some Gram -. With regard to the culture medium, in the plates in which prevailed the presence of Gram + colonies was not observed the growth of any other type of bacteria.

Figure 5. Above

Figure 6. Below

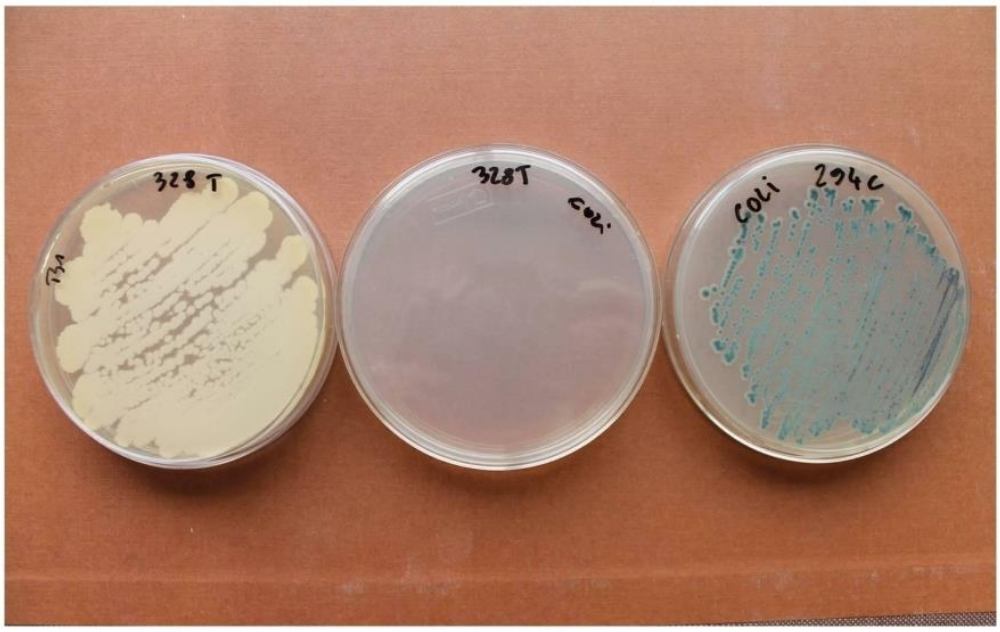

Figure 7.

Results:

1. At the same age, P-Group weight gain was greater than C-group one.

2. Stool consistency assessed with FCS showed no substantial differences between the two groups.

3. Laboratory tests have shown the prevalence of Gram + in the first 7 days of life in P-group than in C-group and the absence of Escherichia coli and other Gram - potentially pathogenic germs in medium in which Gram + colonies grew. In the plates in which there were few Gram + bacteria the flora was highly heterogeneous and composed of both Gram + and Gram -, both bacilli and cocci.

Conclusions:

Based on observations made it is possible to assume that nestlings are born with a sterile bowel and in the first days of life it is colonized by environmental factors, food mixture and parents' bacteria. The early administration, since the first day of life, of the avian probiotic AVICULTURE-2™ causes massive colonization of Gram + bacteria in the bowel, resulting in a competitive exclusion of all other bacteria including potentially pathogenic ones. As nestlings grow they take more food from parents and interact more with the surrounding environment (nest, cage, perches, etc..) and this leads to the noticeable rise also of other forms of bacteria. However, the presence of other bacteria starts from 7th - 8th day of life, after the critical stage in which neonatal mortality is higher, has now passed. For all the above reasons, I think that the administration of avian probiotic AVICULTURE-2™ is a viable alternative to antibiotics as its use promotes the growth of nestlings which also exhibit good health and significantly reduces intestinal infections or colonization of pathogenic bacteria that are considered the most important cause of death in the first week of life of the nestlings.