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INFLUENCE OF OMEGA-3 FATTY ACIDS ON THE LEARNING ABILITY OF THE GUIDE DOG DURING THE TRAINING

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Some scientific evidence shows omega-3 fatty acids, particularly docosahexaenoic acid (DHA), to affect the neurological development of children and puppies by improving visual skills, memory and cognitive learning. The brain development occurs in the last stage of pregnancy and continues until a few months after birth, both in human and in dog (Clandinin et al, 1980; Hinemann et al, 2005; Bauer et al, 2006). In this phase a selective accumulation of arachidonic acid (AA) and DHA happens both in brain and in retina. The demands of DHA in dog can be satisfied by conversion of alpha linoleic acid (ALA), by DHA synthesis in other tissues and by DHA exogenous administration. The DHA supplementation seems more effective than the which one with high amount of ALA for improving retinal function, measured by electroretinogram (Heinemann et al, 2005). Some studies show the usefulness of supplementation with long chain polyunsaturated fatty acids (LCPUFA) in puppies during training through the evaluation of the ability of learning and memory (Kelley et al, 2004; Reynolds et al, 2005; Zicker et al, 2012).

The purpose of this preliminary study was to evaluate the effect of DHA supplementation on learning abilities in a group of future Guide Dogs for the Blind during the phases of education and training.

Two groups of six Labrador dogs (A, study group and B, control group), belonging to School of Guide Dogs of Tuscany (Italy), random selected, were included in the study. All subjects were included in the preliminary training program for guide dog and were fed the same diet (Purina Pro Plan Puppy LB[®]); to each puppy was ensured a 0.06% of DHA. For one year, to the group A a further dose of 35 mg/kg of DHA once a day has been administered while the group B received a placebo. The administration was double-blind. To evaluate the effect of supplementation, we used the standardized tests of the School as they are internationally recognized and can establish both character and learning skills of puppies. The tests were repeated three times during the first year: at 7-9 weeks, at 6-8 months and after one year. The differences of tests were evaluated using the Mann-Whitney test (Wilcoxon), W test, that compares the medians of the two populations.

Some differences were observed between the two groups in some tests results; in particular in those that require a greater visual and sensory capacity and motor coordination as the grid (or abnormal surface) test and the tilting table test. Furthermore the response to fearful stimuli showed a worse outcome in not supplemented subjects in all three tests. All the 6 puppies belonging to group A have passed the training phase and were all eligible for the next guide training (100 %); only three puppies of group B were admitted to the guide training (50%), 1 was selected for Assisted Activities with Animals (16.6%) and 2 were discarded (33.3%). The results obtained in this study could confirm the usefulness of a 35 mg/kg DHA supplementation during the first year of life for improving cognitive skills in dogs.

1) Bauer JE et al, JAVMA, 2007;

2) Clandinin MT et al, Early Hum Dev 1980;

3) Heinemann KM et al, J Nutr 2005;

4) Kelley RL et al, 6th Int Soc Study Fatty Acids Lipids Cong, 2004;

5) Reynolds AJ et al, Nestle Purina Nutrition Forum, 2005;

6) Zicker SC et al, JAVMA, 2012.