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EFFECT OF TRYPTOPHAN AS DIETARY SUPPLEMENT ON DOGS WITH ABNORMAL-REPETITIVE BEHAVIORS

Patricia Kaulfuss*, Sara Hintze, Hanno Würbel
*Animal Welfare and Ethology, Justus-Liebig-University
 Giessen, Germany*

*Corresponding author:

manuela.wedl@univie.ac.at/patricia.kaulfuss@vetmed.uni-giessen.de

Selective serotonin reuptake inhibitors are used commonly in the pharmacologic therapy of abnormal-repetitive behaviors (ARBs) (Landsberg et al. 2003). The aim of this study was to examine the effect in dogs of dietary supplementation with the serotonin precursor L-tryptophan on ARBs.

In a double-blind placebo-controlled crossover design, 29 dogs with 4 different behavior pattern (circling, 5; coprophagia, 9; canine lick granuloma, 9; light chasing and shadow staring, 6) were randomly allocated to 1 of 2 groups. Group 1 received tryptophan followed by placebo, and group 2 vice versa. Treatments with tryptophan and placebo lasted for 2 weeks each. In week 1 (baseline), week 4 (washout), and week 7 (posttreatment) normal dog food was given. Throughout the 7-week test-period, frequency and duration of ARBs was assessed daily by the owners. Data were analyzed by a general linear model.

There was no significant effect of treatment on the frequency or duration of ARBs. In dogs with coprophagia, there was a significant difference in frequency between groups 1 and 2, reflecting a decrease of coprophagia in the second treatment period ($P = 0.015$), regardless of the substance applied. Furthermore, in dogs with coprophagia there was a significant correlation between the frequency dogs were confronted with feces and the frequency of coprophagia ($r_p = 0.49$; $n = 9$; $P = 0.026$).

The present results indicate that dietary supplementation with tryptophan was ineffective in the treatment of ARBs in dogs. However, before tryptophan supplementation in general is disregarded as a potential treatment strategy, several alternative explanations need to be ruled out. First, dosage may have been too low and/or treatment too brief. Second, the subjective assessment of ARB severity by the dog owners may have been unreliable, as indicated by the improvement of coprophagia over the 7-week period. However, this also may be due to an effect of altered owner–dog interaction during this period, or some other ingredients (e.g., vitamin B) of the experimental food. Third, there may be a threshold of severity for a treatment effect to become manifest, as the severity of the ARBs among the dogs was relatively low. Fourth, serotonin has been shown to be more effective in the treatment of compulsive disorders than stereotypies. Although, it is unlikely that all of the ARBs studied were stereotypies rather than compulsive disorders, the combination may have diluted the effect on the overall population, and sample sizes may have been too low to detect a significant effect on specific forms of ARBs.

Key words: tryptophan; abnormal-repetitive behaviors; dog

Reference:

Landsberg, G., Hunthausen, W., and Ackerman, L. (2003) Handbook of Behavior Problems of the Dog and Cat, 2nd edition Saunders, Elsevier, London, United Kingdom

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MATERNAL INFLUENCE ON GRASS-EATING BEHAVIOR IN PUPPIES

Samantha J. Bjone^{a,*}, Wendy Y. Brown^b, Ian R. Price^a

^aSchool of Behavioural, Cognitive and Social Sciences,
 University of New England, Australia,

^bSchool of Environmental and Rural Science, University of
 New England, Australia

*Corresponding author: s.bjone@uq.edu.au

Very little is known about grass-eating behavior or its origin in the domestic dog, *Canis familiaris*. Grass eating is observed in both wolves and dogs, suggesting that the behavior was preserved through domestication and is innate. The nursing mother may also influence grass-eating behavior in her puppies. The current study investigated the influences of the mother and puppy age on grass eating in 5- to 7-week-old puppies.

Six litters from mixed-breed bitches participated in the study. Puppies from each litter were randomly allocated to 2 groups. One group was presented with grass in the presence of the mother ($n = 13$), and the other group was presented with grass without their mother present ($n = 13$) throughout the study. Artificial grass (corkscrew *Vallisneria* aquarium plant) was included in addition to live kikuyu grass (*Pennisetum clandestinum*) to control for the puppies' natural propensity at this age to chew on objects and to distinguish this behavior from chewing and eating live grass. Grass-eating behaviors were observed on 3 consecutive days for each of the fifth, sixth, and seventh weeks of age, totaling 9 testing days.

The puppies spent significantly more time eating the kikuyu grass than chewing on the artificial grass ($t_{(25)} = 10.18$, $P < 0.001$). All puppies were observed eating grass despite the presence or absence of their mother, and there was no main effect of treatment group on the amounts of time spent eating grass ($F(1,22) = 3.1$; $P = 0.09$). Three mothers spent less than 2 minutes each eating grass, whereas the other 3 mothers spent more than 10 minutes eating grass, resulting in an interactive effect between treatment groups and how frequently the mothers ate grass. The puppies with frequent grass-eating mothers present spent more time eating grass than their littermates who were not with their mothers during testing ($P < 0.001$) and puppies with infrequent grass-eating mothers present ($p = 0.001$). Grass eating increased from 5 weeks of age to 6 and 7 weeks of age as the puppies matured ($F(2,44) =$

11.1; $P < 0.001$). The study dogs exhibited 6 vomiting events in comparison to 1399 grass-eating events.

The results of the current study suggest that grass-eating behavior in domestic dogs is innate and that the mother's eating habits further facilitate the puppies' grass eating. As the puppies matured and were weaned, they spent more time eating grass, further supporting the notion that grass is seen as a food source (Bjone et al., 2007). Some researchers contend that dogs use grass as an emetic. However, the low prevalence of vomiting in the current study does not support this claim.

Key words: dog; feeding behavior; grass eating; learning; maternal influence

Reference:

- Bjone, S.J., Brown, W.Y., Price, I.R., 2007 Grass eating patterns in the domestic dog, *Canis familiaris*. Recent Advances in Animal Nutrition in Australia 15, 45–49.

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A DOG'S GAZE TOWARD ITS OWNER FUNCTIONS AS SOCIAL ATTACHMENT AND INCREASES THE OWNER'S URINE OXYTOCIN LEVEL

Miho Nagasawa^{a,*}, Takefumi Kikusui^a, Tatsushi Onaka^b, Mitsuaki Ohta^a

^aDepartment of Animal Science and Biotechnology, Azabu University, Japan

^bDepartment of Physiology, Jichi Medical University, Japan

*Corresponding author: mihnag@gmail.com

Oxytocin (OT) has been shown to play an important role in social bonding in animals (Kikusui et al., 2006). However, it is unclear whether OT is related to interspecies social bonding. In the process of domestication, dogs have developed humanlike visual cognitive abilities (Hare et al., 2002). In this study, we measured urinary OT concentrations of owners before and after interaction with their dogs to examine the possibility that urinary OT concentrations of owners were increased by their dog's gaze, representing social attachment to their owners.

Fifty-five pairs of dogs and their owners participated in 2 experiments. Prior to the experiments, the owners were asked to complete questionnaires concerning their owner–dog relationship. Dog owners interacted with their dogs in a manner typical for them for 30 minutes (interaction experiment) or were instructed not to look at their dogs directly (control experiment). We observed the behaviors of owners and their dogs during the experiments and measured OT concentrations by radioimmunoassay in owners' urine samples collected just before and 20 minutes after interaction with their dogs (Amico et al., 1987).

Using cluster analysis, owners could be divided into 2 groups: one experienced longer gaze durations from their dogs and reported a higher degree of relationship with their dogs (LG); the other received a shorter duration of gaze and

reported a lower degree of relationship (SG). There was a statistically significant interaction between times and groups in urinary OT concentrations ($F[1.84] = 9.03$, $P < 0.01$, 3-way analysis of variance [ANOVA] with repeated-measures, factors: groups [LG and SG], times collecting urine [pre and post], and experiments [interaction experiment and control experiment]). In post hoc analysis, urinary OT was higher in LG than SG after typical interaction with their dogs ($P < 0.01$), but not in the control experiment. In the interaction experiment, a high correlation was found in LG between the frequency of behavioral exchanges initiated by the dog's gaze and the increase in urinary OT ($r_s = 0.73$, $P < 0.01$), but not in SG.

These results suggested that the dog's gaze induced activation of the OT neuroendocrine system. We concluded that interactions with dogs, especially those initiated by the dogs gazing at their owners, can increase the urinary OT concentrations of their owners as a manifestation of attachment behavior.

Key words: dog; gaze; attachment behavior; urinary oxytocin

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HUMAN-DIRECTED GAZING BEHAVIOR IN DOMESTIC DOGS (*CANIS FAMILIARIS*)

Lisa Horn^{1,*}, Péter Pongrácz², Zsófia Virányi³,

Ludwig Huber¹, Ádám Miklósi², Friederike Range¹

¹Department of Neurobiology and Cognition Research, University of Vienna, Austria

²Department of Ethology, Eötvös Loránd University, Hungary

³Konrad Lorenz Institute for Evolution and Cognition, Austria

*Corresponding author: lisa.horn@univie.ac.at

Previous studies have shown that domestic dogs (*Canis familiaris*) initialize communication with humans (e.g., looking, approaching) when they are faced with an insolvable problem. In the current study, we wanted to explore the possibility that this behavior can be influenced by former interaction between dog and owner. We asked whether verbal encouragement by the owner increases the gazing behavior of the dog when it faces an insolvable problem compared to dogs that were not encouraged previously.