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## NOTE

Conditioned Taste Aversion in Predators: Response to  
Sternner and Shumake

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Sternner and Shumake (1978) criticize our practical applications of taste aversion conditioning principles to the prevention of sheep predation by the coyote as if these field studies were pristine laboratory tests of taste aversion theory. They point out that the stockmen were protecting their herds with gun, trap, and poison while we were baiting the sheep ranges with mutton-lithium baits. They do not point out that these same lethal methods were also used in the prior (baseline) years; yet, Gustavson *et al.* (1976) reduced lamb kills by 40 to 60% by adding a lithium baiting program in eastern Washington. Stream (1976) confirmed this finding. Similarly, when Gustavson, Jowsey, and their associates (1977, 1978, 1978) initiated a large lithium baiting program in Saskatchewan, Canada, they reported a 66% decline in lamb kills compared to the prior year.

Sternner and Shumake (1978) adroitly shift their grounds to criticize Ellins *et al.* (1977) for not providing the very baseline and supplemental information they found faulty in Gustavson's report. Ellins and his associates found that lithium baiting was attended by a decline of sheep and lamb kills to virtually zero in Antelope Valley, California. Catalano and Ellins (1978) found that in the following year the total number of sheep and lamb kills was further depressed. Furthermore, they observed that a

lithium-turkey baiting program also resulted in a decline in turkey kills by coyotes. These programs were judged highly successful by the Los Angeles County Agricultural Commissioner and the stockmen who monitored the field operations.

Sternner and Shumake (1978) erroneously attribute to us the hypothesis that the conditioned aversions are due to "negative associations formed between the odor, sight, taste, and texture of these baits and the subsequent gastrointestinal disorders." Even a cursory glance at the literature would reveal that we do not hold that view. This literature indicates that conditioned aversions are acquired regardless of whether or not the subject forms an *association* between the meal and the illness. Strong aversions are acquired specifically for the salient *taste* of the meal and may spread through *taste mediation* to other stimulus aspects of the meal but most strongly to odors in mammals (Rusiniak *et al.*, in press). In general, the palatability of food is adjusted commensurate with the visceral feedback automatically without awareness (Garcia *et al.*, 1974). Furthermore, Sternner and Shumake (1978) imply that our "elaborate theorizing" and "scientific conclusions" rest upon the present field studies. To the contrary, our theoretical assumptions derive from the extensive basic research in feeding behavior reviewed recently in two volumes (Barker *et al.*, 1977; Milgram *et al.*, 1977). Studies of captive coyotes and wolves verified these assumptions in canids (Gustavson *et al.*, 1974, 1976). The sole purpose of the field trials was to determine if, practically, the scattering of lithium-mutton baits on a sheep range would be followed by a reduction in sheep losses. This is now an established fact for which there are now two explanations. On one hand, we believe that free-ranging wild coyotes eat the mutton-lithium baits and become ill, thereby acquiring an aversion for the taste of mutton, then subsequently avoid that source of food, using distal cues. On the other hand, Sternner and Shumake believe that lethal coyote control methods may suddenly and coincidentally become effective whenever lithium baiting is applied to the sheep range. They offer no details on how or why this interaction takes place or any data to support their intriguing explanation.

For those who are interested in this inexpensive and humane method of reducing predation, a summary of results and a methodological guide is available (Gustavson *et al.*, 1978). We offer but one word of caution here. Basic research has established that the predator is most likely to form an aversion for the salient taste in the lithium-prey flesh packet. If the taste of lithium chloride is allowed to predominate, then the predator is apt to acquire an aversion for salty flavors rather than for the prey. Therefore, the lithium chloride should be encased in small, tasteless capsules or diluted in weak solutions near physiological saline molarity and then infused into the prey flesh.

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