packets, making the device more coyote-specific but not quite as attractive.

Another unit — a coyote lure operative device (CLOD) — also holds promise as a means of chemical delivery. The device consists of a plastic vial containing 10 or 15 ml of syrup or other sweet substance, dye, and a toxicant. The bright red dye serves as a biological tracer/marker; in addition to its red color, it fluoresces a reddish orange under black light. The vial is screwed onto a stake, placed at ground level, and then treated with the WU lure that elicits licking and biting by coyotes. Because coyotes avidly consume sugar, captive coyotes, when they bite or chew the exposed vial, usually eat most of the active ingredient suspended in the syrup.

Although these two devices have been used successfully in pen tests with Compound 1080, the most selective poison available for coyotes, neither has been field-tested with active ingredients.

Conclusions

The results of this cooperative research and of many other related studies have added to our understanding of coyote behavior, the effect coyotes have on the livestock industry, and how they may be more effectively controlled. Although the coyote will undoubtedly affect livestock operations for years to come, continued research should lead to techniques of minimizing predation losses in a safe, ecologically sound, and effective way.

No single or combination of control methods (such as traps, M-44s, shooting, guard dogs, electric fencing) has been found to protect livestock from coyote predation under varied types of habitat, terrain, and husbandry, so there is still a great need for more effective and selective attractants and toxicants. In some localities we still do not know how sheep can live compatibly with coyotes. The coyote has been too successful in learning to survive in man's altered environments.

Walter E. Howard is Professor, Rex E. Marsh is Vertebrate Ecologist, and Jerry H. Scrivner is Postdoctoral Researcher, Division of Wildlife and Fisheries Biology, University of California, Davis; Roy Teranishi is Project Leader, Western Regional Research Center, USDA-ARS, Albany, California.

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Newsletters effective in training 4-H leaders

Norma Wightman

The most popular 4-H project in California is foods and nutrition: 14,500 youngsters were enrolled under the leadership of more than 2,200 volunteers in the 1983-84 project year. The potential for improved nutritional practices as well as increased food preparation skills among 4-H youth is considerable as a result of this project. A 1980 survey of foods and nutrition leaders, however, indicated that food preparation skills were receiving much more focus in project work than were nutrition education activities.

To increase nutrition education activities and improve nutrition knowledge among leaders, 4-H began a pilot program using newsletters for in-service training in 18 northern California counties during the 1982-83 project year. Control and experimental groups were drawn at random from all leaders enrolled to lead the foods and nutrition project in those counties. Baseline data on topics commonly taught by foods and nutrition leaders were obtained in June 1982 from 202 leaders.

Procedure

A nutrition-knowledge pretest questionnaire was mailed to leaders at the beginning of the project year (October 1982), and the same test was given at the end of the project year (June 1983). Data collection was entirely by mail through self-reported questionnaires.

During the project year, the experimental group received four nutrition education newsletters focusing on seven topics: menu planning, nutritious snacks, sugar in the diet, conserving nutrients, weight control, label reading, and the basic four food groups. The newsletters featured teaching activities related to these topics that leaders could use in their 4-H groups. The control group received none of the newsletters.

A major problem during the two-year study was leader drop-out, which accounted for the small number of leaders who completed all three questionnaires. Of the leaders contacted initially in June 1982, only 34 percent continued as foods and nutrition leaders in the fall of 1982. Of this remaining number, many failed to complete projects by June 1983. Of those who completed projects, not all responded to all three questionnaires (table 1).

Whether this low rate of leader retention within a given project is typical warrants follow-up study. The rates were consistently lower in the more urban than in the rural counties, where up to 75 percent of leaders remained in the two-year study. The problem of retention demands much closer surveillance in the 4-H program, because it increases the need for training many more new leaders in a specific project as each new 4-H year begins.

Results

The newsletter program was successful in promoting nutrition knowledge gain. Nutrition test scores were computed for the experimental and control groups (postcompletors only) for the pretest and posttest. A significant increase (at the $p=0.01$ level) occurred in the nutrition test score of the experimental group. No statistically significant improvement occurred in the control group (table 2).

The mean change in nutrition knowledge test scores for the experimental group was 0.85 as compared with the -0.52 mean change in the control group score. A t-test on the score changes from pre- to posttest showed a statistically significant difference ($p=0.05$) (table 2).

Comparing the change scores of the control group, the experimental group who read all of the newsletters, and those who read less than all, analysis of variance showed statistically significant differences ($p=<0.05$) among these groups in knowledge gain (table 3). The difference in the change scores of the two experimental subgroups was not statistically significant, although there was a trend toward greater gain in those who had read all of the newsletters.

Overall, the leaders in the experimental group who responded to the posttest

TABLE 1. Frequencies of responses to questionnaires by experimental and control groups

Item	Project recall (n=487)	Pretest (n=444)	Posttest (n=116)
Experimental group	87	67	51
Control group	72	49	28
Respondents dropping foods and nutrition project	43	54	25
Total responses	202	170	104
Percent responses	41.5	38.6	89.6

Newsletters were effective in training in-service 4-H leaders to conduct nutrition education activities such as label reading.

questionnaire gave a positive evaluation of the newsletters. They reported the newsletters as being clear, readable, and interesting. The information was relevant to a majority, and more than 90 percent of these leaders reported half or more of the information as being useful to them in project work during the year.

Discussion

A newsletter approach to in-service training for 4-H project leaders shows promise. Knowledge did increase significantly in the experimental group as compared with the control group, which had no newsletter intervention. Since other training methods, such as meetings, have failed to reach large numbers of leaders, in-service training by mail appears to be a satisfactory alternative. The newsletters are low in cost, can be used by leaders at home, and can be filed for future "teachable" moments.

Statistical tests comparing the reported frequency of teaching nutrition topics before and after the training program suggest that leader behavior was affected by the training. Comparing activity reported in 1982 and 1983, leaders in the experimental group showed a significant increase in frequency of addressing two of seven topics covered in the newsletters: sugar in the diet ($p<0.05$) and food labeling ($p<0.05$). Topics that were not addressed with increased frequency were choosing nutritious snacks, weight control, planning nutritious meals, conserving nutrients in food preparation, and the basic four food groups.

The two topics, sugar in the diet and food labeling, received coverage in two of four newsletters, which featured several suggested learning activities. The other topics were not reinforced by as many learning activities. These two topics were featured in the second and third issues, and it is possible that leaders paid more attention to these newsletters after receiving the first issue. By the time the fourth issue was mailed in March 1983, some of the leaders may have finished or nearly finished their project work. Unfortunately, no measurement was taken of which specific issues were read in entirety or partially.

Although the high dropout rate of volunteers and the mailed self-return questionnaire may have self-selected only the more highly motivated leaders as completors of the study, it appears that the newsletter approach to in-service training deserves additional research. This pilot study suggests that an in-service program by mail can both increase volunteer leader knowledge and promote behavioral change in teaching. This approach should be replicated with other 4-H project subject matter. A newsletter that provides support and recognition of 4-H project leaders may be the most cost-effective method of training. In addition, a long-term study should be done to determine if this method can increase 4-H leader retention as compared with other training approaches.

TABLE 2. Comparison of pre- and posttest knowledge mean scores and score change

		Pretest			Posttest			Score schange pre- to posttest		
Group*	N	Mean	SD	t-test†	Mean	SD	t-test†	Mean	SD	t-test†
E	51	17.84	3.2	−1.34	18.69	3.2	−3.16	.85	2.2	−2.35‡
C	27	16.85	2.9		16.33	3.0		−.52	2.8	

NOTE: Maximum score is 24.
* E = experimental; C = control
† Difference between E and C group means.
‡ Significant at the 0.05 level.

TABLE 3. Mean change scores by groups who read all, less than all, or none of the nutrition newsletters

Group	N	Mean score change	SD	F
All	21	0.57	1.12	
Less than all	16	0.43	0.96	3.22*
None	18	−0.22	0.94	

* Significant at the 0.05 level.

Norma Wightman is 4-H Youth Advisor, Cooperative Extension, Colusa and Glenn counties. *The author acknowledges the assistance of Joanne Ikeda, Nutrition Education Specialist, and Marilyn Townsend, Staff Research Associate, with the study and thanks Milton Fujii, Administrative Analyst, for data analysis. This study was made possible by a grant from the California 4-H Foundation.*