

Special Report

A survey of reasons why veterinarians leave rural veterinary practice in the United States

Aurora Villarroel, DVM, MPVM, PhD, DACVPM; Stephen R. McDonald, DVM; William L. Walker, DVM; Lana Kaiser, MD, DVM; René D. Dewell, DVM, MS; Grant A. Dewell, DVM, PhD

Objective—To identify factors associated with veterinarians leaving a career in rural veterinary practice (RVP).

Design—Cross-sectional descriptive study.

Sample Population—Veterinarians from the United States who no longer worked in RVP.

Procedures—Veterinarians in any area of practice were solicited to participate in an online survey through invitation letters sent to various veterinary associations. Those who indicated that they had left RVP were asked to rank the importance of various potential factors in their decision to leave RVP.

Results—805 responses were obtained from veterinarians who had worked in RVP, of which 246 (30.6%) had left RVP. Most (231/246 [93.9%]) of those who reported leaving RVP had been in practice > 5 years, and 75.2% (185/246) had been in practice > 12 years. Eighty-three (33.7%) who left RVP pursued careers in urban areas, 72 (29.3%) entered academia, and 7 (2.8%) retired. Reasons for leaving RVP ranked by the highest proportions of respondents as being of high importance were emergency duty, time off, salary, practice atmosphere, and family concerns. Women ranked factors such as time off, mentorship, practice atmosphere, conflict with staff, and gender issues as being of high importance more often than men did.

Conclusions and Clinical Relevance—Results suggested that the perceived shortage of veterinarians in RVP may be in part influenced by a lack of retention, particularly among experienced veterinarians. Targeted efforts to tackle issues related to emergency duty, time off, salary, practice atmosphere, and family issues could help alleviate the efflux from RVP. (*J Am Vet Med Assoc* 2010;236:859–867)

The shortage of veterinarians working in food supply veterinary medicine has been identified as a high priority, and several actions have been suggested to help alleviate the shortage of veterinarians in this discipline.^{1–4} Addressing the shortage of veterinarians in food supply veterinary medicine will require not only attracting veterinarians and veterinary students to this field of practice but also identifying ways to retain those who choose a career in food supply veterinary medicine. Although food supply veterinary medicine and RVP are not synonymous, veterinarians employed in RVP tend to practice in areas where agriculture represents a significant part of the local economy.⁵ Therefore, addressing the perceived shortage of veterinarians in RVP should also be considered a priority.

ABBREVIATION

RVP Rural veterinary practice

Although there are few studies specifically targeting RVP, some information may potentially be obtained from studies of large animal practice, food animal practice, food supply veterinary medicine, and mixed animal veterinary practice, in that all of these may reasonably be considered to include components of RVP.⁶ From these studies, it appears that the perceived shortage of veterinarians in RVP may be attributable, at least in part, to a lack of interested students entering veterinary school,^{3,7} loss of interest in food animal practice^{7,8}

From the Department of Clinical Sciences, College of Veterinary Medicine, Oregon State University, Corvallis, OR 97331 (Villarroel); Academy of Rural Veterinarians, 509 N Carroll, Henrietta, TX 76365 (McDonald); Department of Veterinary Preventive Medicine, College of Veterinary Medicine, The Ohio State University, Columbus, OH 43210 (Walker); Department of Medicine, College of Human Medicine, Michigan State University, East Lansing, MI 48824 (Kaiser); and Animal Population Health Institute, Department of Clinical Sciences, College of Veterinary Medicine and Biological Sciences, Colorado State University, Fort Collins, CO 80523 (RD Dewell, GA Dewell). Dr. RD Dewell and Dr. GA Dewell's present address is Department of Veterinary Diagnostic and Production Animal Medicine, College of Veterinary Medicine, Iowa State University, Ames, IA 50011.

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Address correspondence to Dr. Villarroel (aurora.villarroel@oregonstate.edu).

or mixed animal practice^{8,9} during veterinary school, or a lack of retention in food supply veterinary medicine⁹ or mixed animal practice after graduation.^{6,8} Reported factors influencing the lack of retention include perceived lower salaries in rural practice and long working hours that interfere with a balanced lifestyle between work and family.⁸

The present study represents part of a larger effort to understand factors that influence veterinarians to enter and remain employed in RVP. A previous study⁵ described factors associated with influencing veterinarians and veterinary students to become interested in and choose a career in RVP, whereas the present study focused on factors associated with why veterinarians leave RVP.

Materials and Methods

The study protocol was reviewed and approved by the institutional review boards of Oregon State University and The Ohio State University. Details of the study protocol have been published previously.⁵ In brief, an online^a survey was developed by the authors to solicit information on factors that they considered likely to be associated with whether veterinarians would enter or remain employed in RVP. Invitation letters containing a link to the survey and soliciting the participation of veterinarians in any type of practice were distributed to the AVMA, all specialty associations listed in the AVMA directory, all state veterinary associations, all student veterinary associations, and all members of the Academy of Rural Veterinarians. Associations receiving the invitation letter were asked to distribute it as widely as possible, including through newsletters, mail, and e-mail. The invitation letter informed potential respondents about the study's objectives and its voluntary nature, as required by the institutional review boards of the participating institutions. The Web link to the survey remained accessible from January 1, 2008, through May 19, 2008.

Survey—Survey questions were organized into 5 sections, with the third section of the survey related to the present study. The first question in this section asked respondents whether they had ever worked in RVP (yes vs no). Respondents who answered no were directed to the last section of the survey, which contained questions designed to elicit demographic data. Respondents who answered yes were directed to a multiple-choice question that provided them with a list of factors and asked them to rank the importance of each factor on a scale from 1 to 5 (1 = low importance; 3 = average importance; 5 = high importance) in regard to their choosing their first job in RVP (respondents could also indicate that the factor was not applicable). Respondents were then asked to indicate how long they had remained in their first job in RVP and whether they were still employed in RVP (yes vs no). Respondents who answered no to the latter question were directed to another multiple-choice question that provided them with a list of factors and asked them to rank the importance of each factor on a scale from 1 to 5 with regard to their decision to leave RVP. These respondents were also asked to identify their next area of employment after leaving RVP.

Both of the multiple-choice questions included an other response that allowed respondents to specify other factors not included in the available answers. All of these other responses were reviewed separately by at least 2 coauthors and assigned to categories designated by each coauthor. After all answers were assigned, categories selected by the coauthors were cross-matched, and if the coauthors differed with regard to their classification of an answer, a consensus was reached as to which category that answer should be assigned. Kappa values for inter-rater agreement ranged from 0.932 and 0.972 for these questions. No new categories of answers were generated from these other responses.

Data analysis—To avoid biases associated with differences in culture, education systems, and population background, only responses from the United States (as determined by IP address of the respondent) were used in the study. A response rate could not be calculated because the degree of overlap in membership for the various associations to which the invitation letter was sent was not known. No efforts were made to identify duplicate responses from individuals because it was considered unlikely that individual respondents would choose to complete the survey more than once.

Respondents were categorized into 4 US regions (West, South, Midwest, and Northeast) according to the classifications used by the US Census Bureau.¹⁰ Respondents with an IP address that did not originate in the United States and respondents who did not report a graduation year were excluded from the study.

Respondents were also categorized into 4 generational categories according to definitions of the American Association of Retired Persons.¹¹ Generational categories included the silent generation (≥ 62 years old;

Table 1—Demographic characteristics of veterinarians who responded to an online survey on factors associated with leaving a career in RVP.

Factor and categories	All respondents	Men	Women
Generational category			
Silent generation (≥ 62 y)	41	40	1
Baby boomers (43–61 y)	132	83	49
Generation X (31–42 y)	61	24	37
Generation Y (≤ 30 y)	12	5	7
Background			
Rural with livestock experience	148	109	39
Rural with no livestock experience	6	3	3
Urban with livestock experience	69	32	37
Urban with no livestock experience	23	8	15
Professional practice experience			
Recent graduate (1–2 y)	6	3	3
Skilled veterinarian (3–5 y)	9	3	6
Experienced veterinarian (6–12 y)	46	16	30
Seasoned veterinarian (> 12 y)	185	130	55
Geographic region*			
West	54	31	23
South	71	45	26
Midwest	60	36	24
Northeast	20	16	4
Total	246	152	94

*Forty-one respondents did not provide information on geographic region.

born before 1946), baby boomer generation (43 to 61 years old; born between 1946 and 1964), generation X (31 to 42 years old; born between 1965 and 1978), and generation Y (≤ 30 years old; born after 1978).

Year of graduation was used to categorize respondents into groups on the basis of number of years of professional practice experience. Categories consisted of recent graduates (1 to 2 years since graduation), skilled veterinarians (3 to 5 years since graduation), experienced veterinarians (6 to 12 years since graduation), and seasoned veterinarians (> 12 years since graduation). Limits for the categories were selected after consultation with private practitioners on the perceived professional skills of graduate veterinarians.

Two dichotomous background variables were identified: rural versus urban background and previous experience versus no previous experience with livestock. Combining responses to these 2 variables resulted in 4 categories: rural background with previous livestock experience, rural background without previous livestock experience, urban background with previous livestock experience, and urban background without previous livestock experience.

For the questions that asked respondents to assign an importance score ranging from 1 to 5, differences between demographic groups were analyzed by comparing proportions of respondents that assigned a high score (4 or 5) to each factor by means of the Z test,^b with values of $P \leq 0.05$ considered significant. For analyses that involved comparison of > 2 categories, such as comparisons between generational categories or practice experience categories, a Bonferroni correction was used to preserve an overall α value of 0.05.

Results

There were 805 US veterinarians who responded to the survey and reported having worked in RVP during their professional careers. Of these, 100 (12.4%) did not supply further information and 246 (35.0%) reported having left RVP (Table 1). Proportions of male (33.9%) and female (36.9%) respondents who were no longer working in RVP were not significantly ($P = 0.483$) different (Table 2). The proportion of silent generation respondents who had left RVP (60.3%) was significantly

Table 2—Distribution of responses by gender for individuals who responded to an online survey on factors associated with veterinarians accepting a first job in RVP or leaving a career in RVP.

Factor	No. (%) of respondents			
	All	Men	Women	P value
Factors ranked as being of high importance in accepting a first job in RVP*				
Practice atmosphere	555 (79.7)	354 (79.2)	199 (80.6)	0.740
Practice location (state, town, etc)	554 (79.6)	354 (79.2)	198 (80.2)	0.838
Caseload and variety	475 (68.2)	295 (66.0)	179 (72.5)	0.095
Mentorship	401 (57.6)	250 (55.9)	150 (60.7)	0.252
Quality of facilities and equipment	375 (53.9)	228 (51.0)	145 (58.7)	0.062
Potential for practice ownership	349 (50.1)	253 (56.6)	94 (38.1)	< 0.001
Family concerns	334 (48.0)	230 (51.5)	102 (41.3)	0.013
Salary	233 (33.5)	144 (32.2)	88 (35.6)	0.407
Benefits	184 (26.4)	104 (23.3)	79 (32.0)	0.016
Emergency duty	167 (24.0)	85 (19.0)	81 (32.8)	< 0.001
Insurance	160 (23.0)	92 (20.6)	67 (27.1)	0.062
Time off	159 (22.8)	82 (18.3)	76 (30.8)	< 0.001
Other	58 (8.3)	34 (7.6)	24 (9.7)	0.413
No longer working in RVP	246 (30.6)	152 (33.9)	94 (36.9)	0.483
Factors ranked as being of high importance in leaving RVP*				
Emergency duty	133 (55.0)	79 (52.7)	54 (58.7)	0.434
Time off	130 (53.7)	73 (48.7)	57 (62.0)	0.060
Salary	113 (46.7)	70 (46.7)	43 (46.7)	0.903
Family concerns	111 (45.9)	74 (49.3)	37 (40.2)	0.212
Practice atmosphere	96 (39.7)	48 (32.0)	48 (52.2)	0.003
Caseload and variety	73 (30.2)	45 (30.0)	28 (30.4)	0.942
Practice location (state, town, etc)	69 (28.5)	44 (29.3)	25 (27.2)	0.830
Benefits	67 (27.7)	42 (28.0)	25 (27.2)	0.993
Lack of mental stimulation	68 (28.1)	44 (29.3)	24 (26.1)	0.691
Quality of facilities and equipment	65 (26.9)	37 (24.7)	28 (30.4)	0.405
Injury or health issues	59 (24.4)	39 (26.0)	20 (21.7)	0.552
Mentorship	55 (22.7)	22 (14.7)	33 (35.9)	< 0.001
Conflict with other veterinarians	51 (21.1)	29 (19.3)	22 (23.9)	0.493
Insurance	46 (19.0)	31 (20.7)	15 (16.3)	0.502
No potential for practice ownership	39 (16.1)	22 (14.7)	17 (18.5)	0.547
Conflict with staff	25 (10.3)	9 (6.0)	16 (17.4)	0.009
Gender issues	21 (8.7)	0 (0.0)	21 (22.8)	< 0.001
Other	65 (26.9)	39 (26.0)	26 (28.3)	0.814

*Importance of each factor was ranked on a scale from 1 (lowest importance) to 5 (highest importance); factors with a score of 4 or 5 were considered to be of high importance. Total respondents included in this study were 805 veterinarians, including 448 men and 255 women. There were 696 respondents (447 men and 247 women) who provided scores on factors important to them in accepting a first job in RVP, and 242 respondents (150 men and 92 women) who provided scores on factors important in leaving RVP.

($P < 0.001$) higher than proportions of respondents from other generations (Table 3). The proportion of respondents with a rural background that had left RVP (30.8%) was significantly ($P < 0.001$) lower than the proportion of respondents with an urban background who had (45.0%; Table 4); however, proportions of respondents with and without previous livestock experience were not significantly different. Few recent graduates (1 to 2 years since graduation; $n = 64$) and skilled veterinarians (3 to 5 years since graduation; 52) responded to the survey. Therefore, these categories were combined into a single category designated new veterinarians ($n = 116$). Proportion of new veterinarians who had left RVP (12.9%) was significantly ($P < 0.001$) lower than proportions of respondents in the other professional practice categories (Table 5). Finally, similar proportions of respondents from the 4 US geographic regions reported having left RVP (range, 28.7% to 42.5%). The only significant ($P = 0.007$) difference was between the Midwest (42.5%) and the Northeast (30.4%).

Factors associated with accepting the first job in RVP—Factors ranked as being of high importance (score of 4 or 5 on a scale from 1 to 5) in accepting a first job in RVP by the highest proportions of respondents included practice atmosphere and practice location (Table 2), followed by caseload and variety, mentorship, quality of facilities and equipment, and potential for practice ownership. Factors such as family concerns, salary, benefits, emergency duty, insurance, and time off were rated as being of high importance by $< 50\%$ of respondents overall.

Higher proportions of men than women ranked potential for practice ownership and family concerns as being of high importance in their decision to accept a first job in RVP (Table 2), whereas higher proportions of women than men ranked benefits, emergency duty, and time off as being of high importance. In general, higher proportions of generation X and generation Y respondents ranked practice atmosphere, mentorship, quality of facilities and equipment, salary, benefits, emergency

Table 3—Distribution of responses by generational category for individuals who responded to an online survey on factors associated with veterinarians accepting a first job in RVP or leaving a career in RVP.

Factor	No. (%) of respondents			
	Silent generation	Baby boomers	Generation X	Generation Y
Factors ranked as being of high importance in accepting a first job in RVP*				
Practice atmosphere	49 (72.1) ^a	283 (77.7) ^a	139 (81.8) ^{a,b}	82 (89.1) ^b
Practice location (state, town, etc)	51 (75.0)	287 (78.9)	140 (82.4)	74 (80.4)
Caseload and variety	36 (52.9) ^a	249 (68.4) ^b	124 (72.9) ^b	64 (69.6) ^b
Mentorship	27 (39.7) ^a	184 (50.5) ^a	110 (64.7) ^b	78 (84.8) ^c
Quality of facilities and equipment	22 (32.4) ^a	178 (48.9) ^a	109 (64.1) ^b	64 (69.6) ^b
Potential for practice ownership	36 (52.9)	179 (49.2)	92 (54.1)	42 (45.7)
Family concerns	34 (50.0)	170 (46.7)	86 (50.6)	43 (46.7)
Salary	8 (11.8) ^a	91 (25.0) ^a	82 (48.2) ^b	52 (56.5) ^b
Benefits	4 (5.9) ^a	61 (16.8) ^a	66 (38.8) ^b	52 (56.5) ^c
Emergency duty	6 (8.8) ^a	50 (13.7) ^a	67 (39.4) ^b	43 (46.7) ^b
Insurance	1 (1.5) ^a	59 (16.2) ^b	59 (34.7) ^c	40 (43.5) ^c
Time off	6 (8.8) ^a	50 (13.7) ^a	60 (35.3) ^b	42 (45.7) ^b
Other	7 (10.3)	38 (10.4)	10 (5.9)	3 (3.3)
No longer working in RVP	41 (60.3) ^a	132 (36.2) ^b	61 (35.3) ^b	12 (12.4) ^c
Factors ranked as being of high importance in leaving RVP*				
Emergency duty	15 (37.5) ^a	69 (53.1) ^{a,b}	41 (68.3) ^b	8 (66.7) ^{a,b}
Time off	14 (35.0) ^a	71 (54.6) ^{a,b}	39 (65.0) ^b	6 (50.0) ^{a,b}
Salary	14 (35.0)	62 (47.7)	31 (51.7)	6 (50.0)
Family concerns	20 (50.0)	58 (44.6)	27 (45.0)	6 (50.0)
Practice atmosphere	9 (22.5) ^a	49 (37.7) ^{a,b}	31 (51.7) ^b	7 (58.3) ^{a,b}
Caseload and variety	13 (32.5)	36 (27.7)	20 (33.3)	4 (33.3)
Practice location (state, town, etc)	14 (35.0)	34 (26.2)	18 (30.0)	3 (25.0)
Benefits	10 (25.0)	39 (30.0)	17 (28.3)	1 (8.3)
Lack of mental stimulation	10 (25.0)	38 (29.2)	17 (28.3)	3 (25.0)
Quality of facilities and equipment	10 (25.0)	31 (23.8)	20 (33.3)	4 (33.3)
Injury or health issues	12 (30.0)	32 (24.6)	14 (23.3)	1 (8.3)
Mentorship	3 (7.5) ^a	29 (22.3) ^{a,b}	19 (31.7) ^b	4 (33.3) ^{a,b}
Conflict with other veterinarians	3 (7.5)	27 (20.8)	17 (28.3)	4 (33.3)
Insurance	7 (17.5)	27 (20.8)	11 (18.3)	1 (8.3)
No potential for practice ownership	2 (5.0)	23 (17.7)	12 (20.0)	2 (16.7)
Conflict with staff	0 (0.0) ^a	10 (7.7) ^a	15 (25.0) ^b	0 (0.0) ^{a,b}
Gender issues	0 (0.0)	11 (8.5)	8 (13.3)	2 (16.7)
Other	10 (25.0) ^a	35 (26.9) ^a	11 (18.3) ^a	9 (75.0) ^b

There were 703 respondents who had been employed in RVP (68 silent generation, 365 baby boomer, 173 generation X, and 97 generation Y respondents). Of these, 694 respondents (68 silent generation, 364 baby boomer, 170 generation X, and 92 generation Y respondents) provided scores on factors important in accepting a first job in RVP, and 242 respondents (40 silent generation, 130 baby boomer, 60 generation X, and 12 generation Y respondents) provided scores on factors important in leaving RVP.

^{a-c}Proportions with different superscript letters were significantly ($P < 0.050$) different. See Table 2 for remainder of key.

Table 4—Distribution of responses by background for individuals who responded to an online survey on factors associated with veterinarians accepting a first job in RVP or leaving a career in RVP.

Factor	No. (%) of respondents					
	Rural	Urban	P value	Livestock experience	No livestock experience	P value
Factors ranked as being of high importance in accepting a first job in RVP*						
Practice atmosphere	404 (81.8)	151 (74.8)	0.047	491 (79.7)	64 (80.0)	0.931
Practice location (state, town, etc)	400 (81.0)	154 (76.2)	0.193	486 (78.9)	68 (85.0)	0.260
Caseload and variety	330 (66.8)	145 (71.8)	0.234	417 (67.7)	58 (72.5)	0.459
Mentorship	286 (57.9)	115 (56.9)	0.881	362 (58.8)	39 (48.8)	0.113
Quality of facilities and equipment	269 (54.5)	106 (52.5)	0.696	331 (53.7)	44 (55.0)	0.925
Potential for practice ownership	268 (54.3)	81 (40.1)	0.001	316 (51.3)	33 (41.3)	0.116
Family concerns	253 (51.2)	81 (40.1)	0.010	295 (47.9)	39 (48.8)	0.979
Salary	170 (34.4)	63 (31.2)	0.466	204 (33.1)	29 (36.3)	0.665
Benefits	130 (26.3)	54 (26.7)	0.985	155 (25.2)	29 (36.3)	0.476
Emergency duty	114 (23.1)	53 (26.2)	0.430	144 (23.4)	23 (28.8)	0.358
Insurance	115 (23.3)	45 (22.3)	0.852	136 (22.1)	24 (30.0)	0.149
Time off	114 (23.1)	45 (22.3)	0.898	136 (22.1)	23 (28.8)	0.232
Other	38 (7.7)	20 (9.9)	0.420	46 (7.5)	12 (15.0)	0.038
No longer working in RVP	154 (30.8)	92 (44.9)	< 0.001	217 (34.8)	29 (35.4)	0.978
Factors ranked as being of high importance in leaving RVP*						
Emergency duty	74 (49.0)	59 (64.8)	0.024	112 (52.6)	21 (72.4)	0.070
Time off	75 (49.7)	55 (60.4)	0.135	110 (51.6)	20 (69.0)	0.119
Salary	69 (45.7)	44 (48.4)	0.789	102 (47.9)	11 (37.9)	0.418
Family concerns	71 (47.0)	40 (44.0)	0.741	99 (46.5)	12 (41.4)	0.750
Practice atmosphere	51 (33.8)	45 (49.5)	0.023	80 (37.6)	16 (55.2)	0.106
Caseload and variety	48 (31.8)	25 (27.5)	0.573	64 (30.0)	9 (31.0)	0.915
Practice location (state, town, etc)	36 (23.8)	33 (36.3)	0.054	57 (26.8)	12 (41.4)	0.157
Benefits	41 (27.2)	26 (28.6)	0.928	58 (27.2)	9 (31.0)	0.835
Lack of mental stimulation	43 (28.5)	25 (27.5)	0.983	57 (26.8)	11 (37.9)	0.300
Quality of facilities and equipment	38 (25.2)	27 (29.7)	0.538	55 (25.8)	10 (34.5)	0.445
Injury or health issues	44 (29.1)	15 (16.5)	0.039	54 (25.4)	5 (17.2)	0.469
Mentorship	25 (16.6)	30 (33.0)	0.005	47 (22.1)	8 (27.6)	0.668
Conflict with other veterinarians	27 (17.9)	24 (26.4)	0.160	43 (20.2)	8 (27.6)	0.500
Insurance	30 (19.9)	16 (17.6)	0.787	41 (19.2)	5 (17.2)	0.995
No potential for practice ownership	20 (13.2)	19 (20.9)	0.166	34 (16.0)	5 (17.2)	0.926
Conflict with staff	11 (7.3)	14 (15.4)	0.074	17 (8.0)	8 (27.6)	0.003
Gender issues	8 (5.3)	13 (14.3)	0.030	16 (7.5)	5 (17.2)	0.163
Other	38 (25.2)	27 (29.7)	0.538	53 (24.9)	12 (41.4)	0.097

There were 705 respondents (500 with rural background and 205 with urban background; 623 with livestock experience and 82 without) who had been employed in RVP and answered the question on whether they had left RVP. Of these, 696 respondents (494 with rural background and 202 with urban background; 616 with livestock experience and 80 without) provided scores on factors important in accepting a first job in RVP and 242 respondents (151 with rural background and 91 with urban background; 213 with livestock experience and 29 without) provided scores on factors important in leaving RVP.
See Table 2 for remainder of key.

duty, insurance, and time off as being of high importance in their decision to accept a first job in RVP (Table 3) than did respondents in the older generations. Higher proportions of respondents with a rural than with an urban background rated practice atmosphere, potential for practice ownership, and family concerns as being of high importance in their decision to accept a first job in RVP (Table 4). Higher proportions of respondents without livestock experience rated other nonspecified factors as being of high importance, compared with respondents with livestock experience.

The main differences among professional practice experience categories with respect to factors rated as being of high importance in the decision to accept a first job in RVP related to mentorship and benefits. New veterinarians more commonly ranked these as being of high importance than did experienced veterinarians, and experienced veterinarians ranked these as being of high importance more commonly than did seasoned

veterinarians (Table 5). Lower proportions of seasoned veterinarians rated quality of facilities and equipment, salary, emergency duty, insurance, and time off as being of high importance, compared with new and experienced veterinarians.

Factors associated with leaving RVP—The 5 factors ranked by the highest proportions of respondents as being of high importance in their decision to leave RVP were emergency duty, time off, salary, practice atmosphere, and family concerns (Table 2). Significant differences between gender, generational, background, and professional practice experience categories were identified. However, because information was not obtained on age or number of years in practice when respondents left RVP, these differences should be interpreted with caution.

Proportions of men (52.7%) and women (58.7%) who ranked emergency duty as being of high impor-

Table 5—Distribution of responses by professional practice experience for individuals who responded to an online survey on factors associated with veterinarians accepting a first job in RVP or leaving a career in RVP.

Factor	No. (%) of respondents		
	New veterinarians	Experienced veterinarians	Seasoned veterinarians
Factors ranked as being of high importance in accepting a first job in RVP*			
Practice atmosphere	98 (89.1) ^a	106 (79.1) ^{a,b}	351 (77.7) ^b
Practice location (state, town, etc)	93 (84.5)	103 (76.9)	358 (79.2)
Caseload and variety	78 (70.9)	96 (71.6)	301 (66.6)
Mentorship	91 (82.7) ^a	85 (63.4) ^b	225 (49.8) ^c
Quality of facilities and equipment	77 (70.0) ^a	82 (61.2) ^a	216 (47.8) ^b
Potential for practice ownership	58 (52.7)	68 (50.7)	223 (49.3)
Family concerns	53 (48.2)	67 (50.0)	214 (47.3)
Salary	65 (59.1) ^a	62 (46.3) ^a	106 (23.5) ^b
Benefits	64 (58.2) ^a	50 (37.3) ^b	70 (15.5) ^c
Emergency duty	57 (51.8) ^a	49 (36.6) ^a	61 (13.5) ^b
Insurance	51 (46.4) ^a	43 (32.1) ^a	66 (14.6) ^b
Time off	51 (46.4) ^a	51 (38.1) ^a	57 (12.6) ^b
Other	4 (3.6)	11 (8.2)	43 (9.5)
No longer working in RVP	15 (12.9) ^a	46 (33.8) ^b	185 (40.8) ^b
Factors ranked as being of high importance in leaving RVP*			
Emergency duty	12 (80.0)	27 (60.0)	94 (51.6)
Time off	8 (53.3)	28 (62.2)	94 (51.6)
Salary	6 (40.0)	26 (57.8)	81 (44.5)
Family concerns	7 (46.7)	23 (51.1)	81 (44.5)
Practice atmosphere	8 (53.3)	22 (48.9)	66 (36.3)
Caseload and variety	5 (33.3)	18 (40.0)	50 (27.5)
Practice location (state, town, etc)	4 (26.7)	13 (28.9)	52 (28.6)
Benefits	2 (13.3)	14 (31.1)	51 (28.0)
Lack of mental stimulation	4 (26.7)	15 (33.3)	49 (26.9)
Quality of facilities and equipment	3 (20.0)	16 (35.6)	46 (25.3)
Injury or health issues	2 (13.3)	8 (17.8)	49 (26.9)
Mentorship	5 (33.3)	14 (31.1)	36 (19.8)
Conflict with other veterinarians	4 (26.7)	11 (24.4)	36 (19.8)
Insurance	2 (13.3)	9 (20.0)	35 (19.2)
No potential for practice ownership	2 (13.3)	9 (20.0)	28 (15.4)
Conflict with staff	3 (20.0)	7 (15.6)	15 (8.2)
Gender issues	2 (13.3)	5 (11.1)	14 (7.7)
Other	8 (53.3) ^a	8 (17.8) ^b	49 (26.9) ^{a,b}
There were 705 respondents (116 new, 136 experienced, and 453 seasoned veterinarians) who had been employed in RVP and answered the question on whether they had left RVP. Of these, 696 respondents (110 new, 134 experienced, and 452 seasoned veterinarians) provided scores on factors important in accepting a first job in RVP and 242 respondents (15 new, 45 experienced, and 182 seasoned veterinarians) provided scores on factors important in leaving RVP.			
^{a,b} Proportions with different superscript letters were significantly ($P < 0.050$) different.			
See Table 2 for remainder of key.			

tance in their decision to leave RVP were not significantly different (Table 2). A higher proportion of generation X respondents (68.3%) than silent generation respondents (37.5%) ranked emergency duty as being of high importance in their decision to leave RVP, but other differences among generational groups were not identified (Table 3). Higher proportions of respondents with an urban (64.8%) than rural background (49.0%) and without (72.4%) than with (52.6%) previous livestock experience ranked emergency duty as being of high importance in their decision to leave RVP (Table 4). Subjectively, it appeared that many respondents complained about excessive emergency duty in the open-ended questions. There was also a general suggestion that veterinary students seeking a career in RVP should find a practice that employed multiple veterinarians or that shared emergency duty with neighboring clinics.

There was no significant difference in the proportion of women (62.0%) and men (48.7%) who ranked

time off as being of high importance in their decision to leave RVP (Table 2). A higher proportion of generation X respondents (65.0%) than silent generation respondents (35.0%) ranked time off as being of high importance in their decision to leave RVP, but other differences among generational groups were not identified (Table 3). No significant differences among background groups or professional practice experience groups were identified in regard to proportions that ranked time off as being of high importance.

No significant differences were found among demographic groups with regard to proportions that ranked salary and family concerns as being of high importance in their decision to leave RVP. A higher proportion of women (52.2%) than men (32.0%) ranked practice atmosphere as being of high importance (Table 2), and a higher proportion of generation X respondents (51.7%) than silent generation respondents (22.5%) ranked practice atmosphere as being of high importance (Table

3). Respondents with an urban background were more likely to assign high importance to practice atmosphere (49.5%) than were respondents with a rural background (33.8%; Table 4).

In the open-ended question, approximately a third of respondents cited salary as an important reason for leaving RVP. Specific comments related to concerns that livestock owners were not willing to pay the fees charged and that there was limited economic incentive in RVP.

Interestingly, 22.8% of female respondents but none of the male respondents ranked gender issues as being of high importance in their decision to leave RVP (Table 2).

Employment after leaving RVP—Overall, 83 of the 246 (33.7%) respondents who reported having left RVP accepted a position in an urban practice and 72 (29.3%) accepted a position in academia either to pursue advanced clinical training (internship or residency) or an advanced degree or to join the faculty. Twenty-one (8.5%) accepted a position in government, and 16 (6.5%) accepted a position in industry. Although retirement was not provided as an answer, 7 (2.8%) respondents reported leaving RVP to retire. The remaining 47 (19.1%) respondents left RVP for another rural practice or other area of employment that was not specifically listed. Proportions entering various areas of employment after leaving RVP did not differ significantly among generational, background, or professional practice experience groups. However, women who left RVP were significantly ($P = 0.007$) more likely to go into urban practice (42/94 [44.7%]) than were men (41/152 [27.0%]). In contrast, men were significantly ($P = 0.003$) more likely to go into industry (16/152 [10.5%]) than were women (0/94 [0.0%]). All respondents who reported having retired were men.

Discussion

The present study was developed to better understand factors associated with why veterinarians leave RVP. Factors ranked by the highest proportions of respondents as being of high importance in their decision to leave RVP included emergency duty, time off, salary, family concerns, and practice atmosphere. Veterinary schools, veterinary organizations, and practicing veterinarians should consider these factors when addressing the shortage of veterinarians in RVP.

In contrast, in the present study, the factors ranked by the highest proportions of respondents as being of high importance in their decision to accept the first job in RVP primarily revolved around mentorship and practice-specific attributes (ie, practice atmosphere, practice location, caseload and variety, and quality of facilities and equipment), whereas personal economic and family concerns were ranked as being of high importance by lower proportions of respondents. These findings concur in part with results of a survey of graduates of the class of 2006 of the Western College of Veterinary Medicine,⁹ which indicated that practice type, mentorship, and family concerns were the 3 most influential factors when choosing a first employer. In that study,⁹ wages and benefits and nights on call each month were of relatively lesser importance when choos-

ing a first employer. Although the survey in the present study specifically asked respondents about factors important in accepting their first position in RVP, other studies^{6,12,13} on hiring of veterinarians for positions in RVP or food supply veterinary medicine have reported similar findings. In these studies, salary, benefits, work environment, job satisfaction, desirable location, quality of life, hours worked, and family time were important concerns of job applicants.

Our data concur with findings of previous reports that the possible shortage of veterinarians in RVP may be due, in part, to a combination of low attraction of new graduates^{3,7} and lack of retention.⁸ Our results also concur with findings of a survey¹⁴ conducted in 2004, in which 17% of veterinarians with > 5 years of experience who worked primarily with food animals switched careers. That survey also found that 26% of companion animal veterinarians and 36% of mixed animal veterinarians switched their career focus (mostly toward government employment), suggesting that career paths within the veterinary profession are dynamic and that career switching is not limited to RVP.

Contrary to the perceived current common wisdom regarding low retention of young practitioners, in the present study, the silent generation had the highest proportion of respondents who had left RVP, whereas generation Y had the lowest proportion of respondents who had left RVP. Surprisingly, 29.3% of respondents who left RVP entered academia, and this percentage was similar across generational, background, and professional practice experience groups. In a previous study,¹⁴ 27.2% of food animal veterinarians who left that practice area switched to work with companion animals and 25% switched to government employment. Differences between the present and this previous study may reflect differences in the specific questions asked in the 2 surveys and inherent differences between the respondents (eg, food animal practitioners vs individuals in RVP without regard to species treated).

Factors in the present study ranked by the highest proportions of respondents as being of high importance in their decision to leave RVP included emergency duty, time off, salary, family concerns, and practice atmosphere. The factors emergency duty and time off likely were interrelated, in that excessive emergency duty could lead to a perception of not having enough time off. Similar to numerous other professions for which emergency duty is required, personal time may be abruptly interrupted by emergency calls, inconveniencing not only the individual, but also the individual's spouse, family, and friends.

Inadequate salary has been reported by recruiters of recent graduates as an important decision factor when accepting a job position.^{8,13} However, AVMA surveys of new graduates have repeatedly found that veterinarians working exclusively with large animals have some of the highest overall starting salaries.^{15,16} Importantly, in those surveys, categories were included for equine practice and large animal exclusive practice but not for food animal exclusive practice or RVP. Although it could be inferred that those in large animal exclusive practices were primarily food animal practitioners in rural areas, this may not be the case.

Some answers to open-ended questions in the present study, such as comments about the unwillingness of some livestock owners to invest in veterinary care for their animals, may indicate that economic concerns other than salary alone play an important role in the decision to leave RVP.

We believe that there is a common perception that the number of opportunities to make a living as a primary care professional in RVP are decreasing in North America. Changes in population have negatively affected rural areas¹⁷ and, indirectly, the veterinarians working in those rural areas. Animal agriculture production units are becoming larger and may be less dependent on practitioner-provided individual animal veterinary care owing to a greater focus on disease prevention, protocol-guided diagnosis and treatment of individual animals, and employee training. Rural practices may have to become flexible to alter their focus and management style to remain economically viable by providing advanced services requested by animal owners in rural areas. Animal owners, especially those with companion animals, expect their animals to receive current and high-quality veterinary care.¹⁸ However, the amount of money that clients are willing to pay for those services may vary depending on the perceived value of their animals.

Inherent biases associated with Web-based surveys^{19,20} should be recognized when results of the present study are evaluated. In addition, results from categories for which few observations were recorded should be interpreted with caution.

Major limitations of the present study include response bias and possible misclassification bias associated with the use of multiple-choice questions with fixed answers. The invitation letter for the survey in the present study was distributed to multiple veterinary organizations that were asked to redistribute it as widely as possible. Therefore, we could not determine the number of individuals who could potentially have received the invitation and could not assess the extent of nonresponse bias. The title of the survey on the Web site (ie, "Factors that influence retention of rural veterinarians") may have meant that those with a previous interest in RVP were more likely to respond to the survey. Our intention was to include veterinarians who did not have an interest in RVP for comparison. Nevertheless, it seems likely that our sample population is not representative of the general population of US veterinarians. However, we cannot determine this accurately owing to the lack of census data on rural veterinarians.

For the survey used in the present study, we provided respondents with lists of factors selected by the coauthors on the basis of personal experience, communications with colleagues, and literature review that we thought would have been important in the decision to accept a first job in RVP or leave this type of practice. However, use of these defined factors may have resulted in some degree of misclassification bias, in that some choices may not have adequately matched respondents' desired answers. To help reduce this bias, we added an open-ended other response for some questions so that respondents could express a more specific answer if desired.

Another important limitation of the present study was the lack of specific questions on how old respondents were when they left RVP or how long after graduation they left RVP, possibly leading to misclassification bias among respondents of the older generations and the highest years of practice experience. For example, it is possible that a respondent of the silent generation had left RVP shortly after graduation and should have been considered part of the baby boomer generation or generation X instead. In contrast, generation Y respondents and respondents with the least amount of professional practice experience would have had no possibility of misclassification because there was no younger generational or lower practice experience category.

Problems related to the shortage of veterinarians in rural parts of the United States may be difficult to solve owing to the multiple factors that are involved. In the present study, salary, time off, and emergency duty were not highly ranked, in terms of proportions of respondents scoring them as being of high importance, as important factors in the decision to accept a first job in RVP but were the 3 most highly ranked factors in the decision to leave RVP. This difference may suggest that as veterinarians gain experience, their needs and desires may change from the original reasons for having an interest in RVP. Another possible explanation for this difference is that because veterinarians had selected practices with specific personal qualities, they were less likely to have detrimental personal quality experiences. Lastly, it is possible that because veterinarians focused on personal qualities in accepting a first job in RVP, they placed less emphasis on factors such as salary, time off, and emergency duty, which eventually became important issues as time passed. This suggests that to promote retention of personnel in RVP, these positions may need to evolve over time to meet the changing needs of veterinarians. As practitioners mature, they may place an increased emphasis on salary to support a growing family and additional time off to pursue other interests. It is apparent from findings of the present study that practitioners must work with their colleagues to achieve a balance between meeting needs of clients and fulfilling requirements of practitioners.

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- a. Survey Gizmo, Widgix Software Co, Boulder, Colo. Available at: www.surveygizmo.com. Accessed May 20, 2008.
 - b. Minitab, version 15, Minitab Inc, State College, Pa.
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References

1. Campbell JS. Observations on perceived shortage of food animal veterinarians (lett). *J Am Vet Med Assoc* 2003;222:432.
2. Narver HL. Demographics, moral orientation, and veterinary shortages in food animal and laboratory animal medicine. *J Am Vet Med Assoc* 2007;230:1798–1804.
3. Sterner KE. An invited perspective on the shortage of veterinarians in food supply veterinary medicine. *J Am Vet Med Assoc* 2006;229:30–32.
4. Prince JB, Andrus DM, Gwinner KP. Future demand, probable shortages, and strategies for creating a better future in food supply veterinary medicine. *J Am Vet Med Assoc* 2006;229:57–69.
5. Villarreal A, McDonald SR, Walker WL, et al. A survey of reasons why veterinarians enter rural veterinary practice in the United States. *J Am Vet Med Assoc* 2010;236:849–857.

6. Schmitz JA, Vogt RJ, Rupp GP, et al. Factors associated with practice decisions of Nebraska veterinarians regarding type of practice and community size. *J Vet Med Educ* 2007;34:340–349.
7. Chenoweth PJ. Editorial: food animal veterinary futures. *J Vet Med Educ* 2004;31:323–328.
8. Andrus DM, Gwinner KP, Prince JB. Job satisfaction, changes in occupational area, and commitment to a career in food supply veterinary medicine. *J Am Vet Med Assoc* 2006;228:1884–1893.
9. Jelinski MD, Campbell JR, Naylor JM, et al. Factors affecting the career path choices of graduates at the Western College of Veterinary Medicine. *Can Vet J* 2008;49:161–166.
10. US Census Bureau. Census regions and divisions of the United States. Available at: www.census.gov/geo/www/us_regdiv.pdf. Accessed Oct 6, 2008.
11. Rimkus A, Melinchok MD, McEvoy K, et al, eds. *Thesaurus of aging terminology*. 8th ed. Washington, DC: American Association of Retired Persons, 2005.
12. White BJ, Gwinner KP, Andrus DM, et al. Unique educational methods to improve the veterinary employment selection process for rural mixed-animal practices. *J Vet Med Educ* 2007;34:517–523.
13. Prince JB, Gwinner K, Andrus DM. Applicant expectations and decision factors for jobs and careers in food-supply veterinary medicine. *J Vet Med Educ* 2008;35:14–19.
14. Andrus DM, Gwinner KP, Prince JB. Chapter 20. Food supply veterinarian career retention survey. *Food Supply Veterinary Medicine Coalition report*. Schaumburg, Ill: AVMA, 2006. Available at: www.avma.org/fsvm/fsvmc/fsvmc_20.pdf. Accessed Apr 6, 2009.
15. Shepherd AJ. Employment, starting salaries, and educational indebtedness of year-2007 graduates of US veterinary medical colleges. *J Am Vet Med Assoc* 2007;231:1813–1816.
16. Shepherd AJ. Employment, starting salaries, and educational indebtedness of year-2008 graduates of US veterinary medical schools and colleges. *J Am Vet Med Assoc* 2008;233:1067–1070.
17. Albrecht DE. *The changing West: a regional overview*. Population brief: trends in the Western US. Logan, Utah: Western Rural Development Center, 2008.
18. Coe JB, Adams CL, Bonnett BN. A focus group study of veterinarians' and pet owners' perceptions of the monetary aspects of veterinary care. *J Am Vet Med Assoc* 2007;231:1510–1518.
19. Eysenbach G, Wyatt J. Using the Internet for surveys and health research. *J Med Internet Res* 2002;4:E13.
20. Mosquin P, Whitmore R, Suerken C, et al. Population coverage and nonresponse bias in a large-scale human exposure study. *J Expo Anal Environ Epidemiol* 2005;15:431–438.