

Food Animal Economics

Results of a survey to determine demographic and business management factors associated with size and growth rate of rural mixed-animal veterinary practices

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Objective—To determine potential associations between demographic and business management factors and practice size and growth rate in rural mixed-animal veterinary practices.

Design—Cross-sectional survey.

Participants—54 mixed-animal practitioners.

Procedures—A cross-sectional survey (96 questions) was electronically disseminated. Responses were collected, and outcomes (number of veterinarians [NV], growth in number of veterinarians [NVG], gross practice income [GPI], growth in gross practice income [GPIG], gross practice income per veterinarian [GPIV], and growth in gross practice income per veterinarian [GPIVG]) were calculated. Bivariate analyses were performed and multivariable models created to determine associations between survey responses and outcomes of interest.

Results—Survey respondents were from mixed-animal practices, and most (46/54 [85.2%]) practiced in small communities (< 25,000 people). Study practices had a median \pm SD NV of 2.3 ± 1.9 veterinarians, median GPI of $\$704,547 \pm 754,839$, and median GPIV of $\$282,065 \pm 182,344$. Multivariable regression analysis revealed several factors related to practice size, including the number of associate veterinarians and veterinary technicians in the practice, service fee structure, and employment of a business manager. Typically, practices had positive mean growth in NVG (4.4%), GPIG (8.5%), and GPIVG (8.1%), but growth rate was highly variable among practices. Factors associated with growth rate included main species interest, frequency for adjusting prices, use of a marketing plan, service fee structure, and sending a client newsletter.

Conclusions and Clinical Relevance—Mixed-animal practices had a large range in size and growth rate. Economic indices were impacted by common business management practices. (*J Am Vet Med Assoc* 2010;237:1385–1392)

The ability to generate and grow income impacts long-term sustainability of veterinary practices. Structure and management of veterinary practices in the United States is highly variable; however, use of appropriate business management practices can increase the income received by veterinary practitioners.^{1,2} In a study² published in 2000, 19 standard business practices were evaluated, which revealed that

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This manuscript represents a portion of a thesis submitted by the senior author to the Department of Agricultural Economics at Kansas State University Graduate School as partial fulfillment of the requirements for the Master's in Agribusiness degree.

Supported by the Department of Clinical Sciences, College of Veterinary Medicine, Kansas State University.

The authors thank Dale Grotelueschen, John Seeger, and Gerry Stokka for assistance with design and conduct of the survey.

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ABBREVIATIONS

AABP	American Association of Bovine Practitioners
AVC	Academy of Veterinary Consultants
GPI	Gross practice income
GPIG	Growth in gross practice income
GPIV	Gross practice income per veterinarian
GPIVG	Growth in gross practice income per veterinarian
KSUCVMCE	Kansas State University College of Veterinary Medicine Continuing Education
NV	Number of veterinarians
NVG	Growth in number of veterinarians

veterinarians often failed to take advantage of many of these techniques and as a result, failed to achieve their potential income. Three factors have been identified as metrics of veterinary practice financial success regardless of species focus: good business and financial

management, employee management, and client relations.¹ That study² and another³ have focused on factors influencing individual income of veterinary professionals; however, little research has been conducted to compare GPI or GPIG with the demographic and business management characteristics of rural mixed-animal practices.

Evaluating overall practice size can be a useful metric when evaluating practice sustainability. In 1 survey,⁴ more than half of all practices consisted of > 1 veterinarian, and 69.6% of mixed-animal practices consisted of > 1 veterinarian. Simply evaluating the income of each veterinarian may not yield an accurate assessment of the contribution of management techniques to the overall economic size of a practice. Practice size can be measured by a number of factors, including the number of veterinarians employed by the practice and overall GPI. Although gross income is not the sole method advocated for determining the value of a practice, knowledge of this number can facilitate valuation calculations.^{5,6} However, for practitioners desiring to increase practice size, an understanding of the factors associated with larger practices can be beneficial.

Practice growth rate is also an important variable when evaluating long-term sustainability. Economic growth is important for any type of business in an economy because of the constant increase in costs required to operate a business.⁷ If the economic growth rate for a veterinary practice does not meet or exceed the economic inflation rate, the business will not be able to survive financially. Therefore, monitoring growth rate is an important tool for owners with a business goal of expansion as well as for all owners desiring economic sustainability.

Other surveys have identified differences in practice income⁸ and structure⁴ and the impact of business techniques¹ on the basis of the species focus of a practice. These differences are likely related to the inherent structural differences of the industries or consumers served by each practice on the basis of their species orientation. Thus, business management decisions for a practice should account for the characteristics of their target consumers, and applying the same business techniques may not yield the same results for different types of veterinary practices.

The percentage of new veterinary graduates entering mixed-animal practice decreased between 1989 and 2007,⁹ and authors of a study¹⁰ on the supply and demand of mixed-animal and food supply veterinarians predict an estimated 4% annual shortfall in veterinarians in this area. Although potential shortages have been indicated, results of 1 study¹¹ suggest that problems related to livestock producers obtaining services may be most closely related to practice management. Therefore, identifying management factors that influence size and growth rates in rural mixed-animal practice is important for practitioners working in this environment.

In a survey¹² of recruiters, more respondents in food or mixed-animal practices reported that it was difficult to attract new veterinarians to their practice, compared with results for companion-animal practices or industry. Income and the quality of life in a rural environment are highly ranked traits by practitioners

when making their practice selection.¹³ Financial considerations are one of the most highly ranked attributes for practice selection by students.^{14,15} Therefore, a potential reason for the challenge in hiring veterinarians into mixed-animal practices is differences in starting salary based on species focus of a practice. In 2008, new graduates entering mixed-animal practice had a lower mean starting salary, compared with the salary for those entering small-animal exclusive or small-animal predominant practices.¹⁶ Mixed-animal practices need to be sustainable, and if the desire is to expand the practice, they need to be of sufficient size to support a competitive starting salary for new associates.

The objectives of the study reported here were to determine potential associations between demographic and business management factors and mixed-animal rural practice size and growth rate measured over a 5-year period. Although investigators in other studies^{1,2} have evaluated relationships between specific management practices and individual veterinarian income, the study reported here was unique because it evaluated the relationship between specific business techniques and overall GPI. Determining factors contributing to GPIG or GPIVP will enable practitioners to implement strategies consistent with long-term practice goals.

Materials and Methods

Sample population—The target survey population was veterinarians at rural mixed-animal practices. Therefore, e-mails were sent to veterinarians via 3 electronic listserves (AABP [n = 1,943 veterinarians], AVC [500], and KSUCVMCE [967]) inviting them to participate in the online survey. Potential study participants consisted of veterinarians with an interest in bovine medicine (AABP and AVC listserves) or who had attended a Kansas State University Continuing Education conference (KSUCVMCE listserve). A hyperlink to the survey form on the Web was provided in the e-mail, and participants submitted responses anonymously.

Survey—A cross-sectional survey instrument was designed to elicit data necessary to evaluate the outcomes of interest (size, income, and growth rate for rural mixed-animal practices), practice demographics, and use of several common business management techniques. The survey was divided into 3 sections (demographics, economic practice characteristics, and business management practices). Demographic questions collected information on practice location, community type, number of employees in the practice, and species focus of the practice. Two series of questions were designed to elicit the amount of time practitioners spent on or income generated by various species. Responses were solicited through a series of questions that requested the percentage of income or time a veterinarian spent on 1 of 5 species categories (small animal–exotic, equine, beef, dairy, or swine). Answers from this series of questions were expected to sum to 100%; however, when the sum was not within the range of 95% to 105%, the question was deemed incomplete and the answers from that responder were

discarded. When the sum for the answers to this series of questions was between 95% and 105%, but not exactly 100%, a ratio was used on the basis of the answers to adjust the final values to equal a sum of 100% for time or income. Practitioners were also asked to select 1 species area as the self-defined species focus or primary species interest of the practice.

The practice economics portion of the survey requested data from the preceding 5 years (2003 through 2007) on the number of veterinarians in the practice and GPI. Practices with GPI < \$100,000 for > 1 year of the study period were eliminated from the data set to optimize external validity of the findings because these could have represented respondents who were not devoted to the full-time practice of veterinary medicine over the entire study period.

In the section on business management practices, questions were asked regarding frequency of financial data analysis, method and frequency for updating prices, pricing structures, use of business plans, frequency of consultant use, and methods of communication with clients. The final survey instrument (ie, the Practitioner-based Best Business Management Practices Survey)^a comprised 96 questions and was administered by use of a Web-based questionnaire.

Practice size and growth rate calculations—Three dependent variables were created to evaluate practice size via the survey data (NV in the practice over the 5-year study period, mean GPI, and mean GPIV). The mean number of reported veterinarians (associates and owners) within each practice for each study year was calculated for the 5 study years to

yield NV. The 5-year mean GPI was used to calculate GPI. The gross income for each year was divided by the NV listed in the practice for that year to create a value for gross income per veterinarian for each study year; the mean of these values then was determined to create GPIV.

Practice growth rate was determined through the creation of 3 variables. The NVG was calculated by use of NV from the 5 calendar years (2003 through 2007) included in the study to yield an annual growth rate for adjacent study years. The mean growth rate over the four 2-year periods was then calculated to generate the value for NVG. The mean percentage GPIG and GPIVG were calculated in a similar manner by use of the appropriate base variables (GPI and GPIV, respectively).

Statistical analysis—Data were imported into a commercial statistical software package^b for analysis. Descriptive statistics were performed for demographic variables. Bivariate analyses were performed to determine potential associations between responses to survey questions and each outcome variable of interest (NV, GPI, GPIV, NVG, GPIG, and GPIVG). Multivariable models were created for each outcome variable by use of effects identified as significant ($P < 0.10$) in the bivariate analysis. Then, the fixed effect with the largest P value ($P \geq 0.10$) in the multivariable model was eliminated. This iterative process was repeated until only significant ($P < 0.10$) effects remained in the final model for each outcome variable. Survey responses with missing data for any of the significant effects were not included in the final models.

Table 1—Descriptive statistics of demographic variables for respondents (n = 54) to a management practices survey of rural mixed-animal veterinarians.

Survey question	Mean	SD	Median
What is your current practice radius? (ie, the 1-way distance to farms accounting for 95% of your farm income)	80.5 km (50 miles)	71.6 km (44.5 miles)	56.3 km (35 miles)
How many other food animal practices are located within a 48-km (30-mile) radius of your clinic?	4.9	5.6	4.0
How many of each of the following positions are in the practice?			
Registered veterinary technicians	2.2	1.4	0
Lay help (secretarial, kennel, or other)	5.3	3.9	4.0
How many years have you been at this practice?	19.6	10.4	20.0
What percentage of time do veterinarians at the practice spend doing the following?			
Practicing veterinary medicine	80.2	13.2	80.0
Managing the practice (inventory or personnel)	14.2	9.4	15.0
Other	5.7	7.3	5.0
What percentage of time do veterinarians at the practice spend on each of the following species?			
Small animal–exotic	33.2	24.6	30.0
Equine	12.0	15.6	10.0
Dairy	25.0	31.8	2.5
Beef	26.4	25.4	17.5
Swine	3.4	12.5	0
What percentage of income does the practice generate from each of the following species?			
Small animal–exotic	32.4	25.3	33.5
Equine	10.9	17.5	5.0
Dairy	25.1	32.3	4.0
Beef	27.7	28.1	19
Swine	4.1	14.5	0

Results

The number of participants who began the survey was 162, with 75 completing the survey. However, only 57 completed the required economic questions necessary to generate the outcome variables of interest. Three practices were removed from the data set because of GPI < \$100,000 in > 1 year of the study period. As a result, 54 practices were used in the data set for analyses, which yielded a usable survey rate of 33.3% (54/162). In contrast, the overall survey response rate was 1.6% (54/3,410).

Survey respondents were from 21 states, with the highest number being from Kansas (13/54 [24.1%]). Over half of the respondents (29/54 [53.7%]) were at practices in towns with a population of < 5,000 people, whereas 46 of 54 (85.2%) respondents were at practices in towns with a population of < 25,000 people. Most (41/54 [75.9%]) respondents graduated from veteri-

Table 2—Descriptive statistics of calculated variables used to determine practice size and growth over the 5-year study period (2003 through 2007) from data collected from a survey of rural mixed-animal practitioners (n = 54).

Variable	Mean	SD	Median	Minimum	Maximum
NV (No.)	2.8	1.9	2.3	1.0	8.8
GPI (\$)	940,097	754,839	704,547	\$125	3,060,000
GPIV (\$)	333,351	182,343	282,065	\$121,600	1,026,666
NVG (%)	4.4	10.6	0.0	-13.0	46.0
GPIG (%)	8.7	8.5	8.1	-9.2	34.3
GPIVG (%)	8.1	11.2	5.8	-10.9	68.5

Variables representing practice size include the 5-year mean NV, GPI, and GPIV. Variables representing practice growth include mean NVG, GPIG, and GPIVG.

nary school before 1997 and had spent a mean \pm SD of 19.6 ± 10.4 years in practice at the time of survey completion. The majority (51/54 [94.4%]) of respondents were practice owners. Only 11 of 54 (20.4%) respondents considered small animal-exotic as the primary focus of the practice, whereas 19 (35.2%) considered beef and 19 (35.2%) considered dairy as the primary focus. Additional demographic characteristics of study respondents were summarized (Table 1).

Outcome variables for practice size (NV, GPI, and GPIV) and growth (NVG, GPIG, and GPIVG) were calculated (Table 2). Significant positive associations were identified between GPI and both NV and GPIV. However, NV was not significantly ($P = 0.79$) associated with GPIV. Significant positive associations were identified among all 3 growth outcomes (NVG, GPIG, and GPIVG).

Bivariate analyses revealed significant associations between NV and number of employees (registered veterinary technicians and lay assistants), percentage of time spent managing the practice, percentage of income from beef, use of a business consultant, and having a clinic website. Multivariable models were created for NV, GPI, and GPIV (Table 3). In the multivariable model to evaluate factors associated with NV, the percentage of time spent managing the practice was negatively associated with NV, whereas the number of registered veterinary technicians was positively associated with NV. Several factors were associated with GPI in the bivariate analyses; however, in the final multivariable model, only the number of associate veterinarians, number of registered veterinary technicians, and service fee schedules significantly influenced GPI. Practices that charged the same service fees for all clients had a significantly

Table 3—Results of multivariable analysis of factors associated with 5-year mean NV, GPI (\$), and GPIV (\$) from data collected from a survey of rural mixed-animal practitioners.

Factor	Variable	Estimate	SE	t ratio	P value
NV ($R^2 = 0.64$ [n = 53])	Intercept	2.49	0.32	7.67	< 0.01
	Percentage of time veterinarians in the practice spend managing the practice (inventory or personnel)	-0.04	0.02	-2.40	0.02
	No. of registered veterinary technicians in the practice	0.97	0.11	8.77	< 0.01
GPI ($R^2 = 0.65$ [n = 52])	Intercept	466,642	84,443	5.53	< 0.01
	No. of associate veterinarians in the practice	197,489	35,684	5.53	< 0.01
	No. of registered veterinary technicians in the practice	201,317	47,338	4.25	< 0.01
	Same service fee schedules for all clients	-128,701	65,083	-1.98	0.05
	Service fees the same for all clients	827,896*	94,953	—	—
GPIV ($R^2 = 0.53$ [n = 50])	Intercept	214,731	36,362	5.91	< 0.01
	No. of associate veterinarians in the practice	38,596	9,594	4.02	< 0.01
	Percentage of income generated from beef cattle	2,378	686	3.47	< 0.01
	Percentage of income generated from swine	5,843	1,326	4.41	< 0.01
	Business manager for the practice (independent of the practice owner or veterinarian)	38,417	22,022	1.74	0.09
	The practice has a business manager	400,082*	37,466	—	—
	The practice has no business manager	323,249*	21,738	—	—

*Value reported is the least squares mean estimate.
— = Not applicable. n = No. of respondents.

($P = 0.05$) lower least squares mean GPI (mean \pm SE, \$827,896 \pm 94,852), compared with the mean GPI for practices whose fees differed among clients within the practice (\$1,085,297 \pm 87,821). The number of associate veterinarians in the practice, percentage of income generated from beef and swine, and employment of a business manager were all positively associated with GPIV in the multivariable analysis.

The multivariable models for evaluating NVG, GPIG, and GPIVG explained less of the variation in

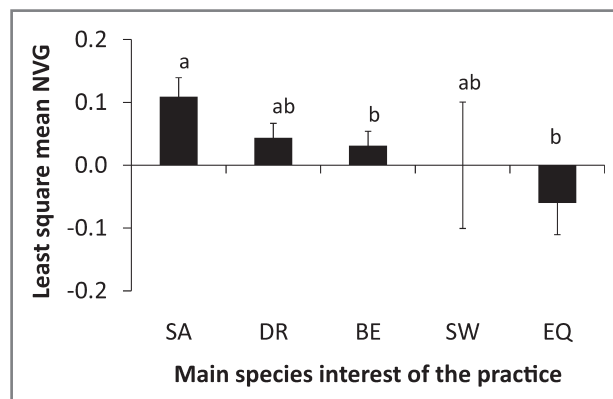


Figure 1—Least squares mean \pm SD estimate of the 5-year annual NVG for rural mixed-animal practices on the basis of main species interest for the practice, as self-defined in responses by practitioners ($n = 54$). Species interest was defined as small animal-exotic (SA), dairy (DR), beef (BE), swine (SW), and equine (EQ). ^{a,b}Values with different superscript letters differ significantly ($P < 0.05$).

these outcome variables ($R^2 = 0.16, 0.20,$ and $0.17,$ respectively), compared with results for the multivariable models for evaluating NVG, GPI, and GPIV ($R^2 = 0.64, 0.65,$ and $0.53,$ respectively). Few factors were associated with NVG in the bivariate analyses, and only the predominant species interest of the practice (self-defined primary focus) was significantly associated with NVG in the multivariable model (Figure 1; Table 4). The frequency for adjusting prices and charging the same service fees for all clients were both associated with GPIG in the multivariable analysis (Figure 2). In the final multivariable model, GPIVG was influenced by use of a marketing plan and sending a client newsletter.

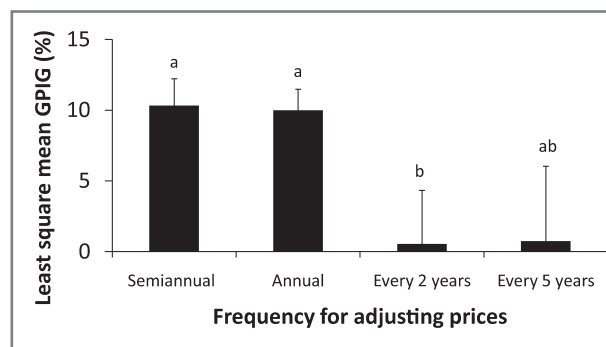


Figure 2—Least squares mean \pm SD estimate of the 5-year annual GPIG for rural mixed-animal practices on the basis of frequency for adjusting prices indicated in responses by practitioners ($n = 51$). ^{a,b}Values with different superscript letters differ significantly ($P < 0.05$).

Table 4—Results of multivariable analysis of factors associated with 5-year mean NVG, GPIG, and GPIVG for data collected from a survey of rural mixed-animal practitioners.

Factor	Variable	Sum of squares	Fratio	Pvalue
NVG ($R^2 = 0.16$ [$n = 54$])	Main practice species interest	0.09	2.35	0.07
	LSM \pm SE estimates for main species interest			
	Beef	0.03 \pm 0.02	—	—
	Dairy	0.04 \pm 0.02	—	—
	Equine	-0.06 \pm 0.05	—	—
	Small animal-exotic	0.11 \pm 0.03	—	—
GPIG ($R^2 = 0.20$ [$n = 51$])	Frequency for adjusting prices	0.05	2.84	0.05
	LSM \pm SE estimates for frequency for adjusting prices (%)			
	Semiannually	10.3 \pm 1.9	—	—
	Annually	10.0 \pm 1.5	—	—
	Every 2 y	0.5 \pm 3.8	—	—
	Every 5 y	0.7 \pm 5.3	—	—
	Same service fees for all clients	0.02	3.57	0.07
LSM \pm SE estimates for same service fees (%)				
	Service fees the same for all clients	8.2 \pm 2.1	—	—
	Service fees differ among clients	12.5 \pm 2.4	—	—
GPIVG ($R^2 = 0.17$ [$n = 54$])	Practice uses a marketing plan	0.08	7.61	0.01
	LSM \pm SE estimates for use of a marketing plan (%)			
	Practice uses a marketing plan	13.9 \pm 3.0	—	—
	No marketing plan	4.4 \pm 1.8	—	—
	Practice sends a client newsletter	0.05	5.05	0.03
	LSM \pm SE estimates for client newsletter (%)			
	Practice sends a client newsletter	5.6 \pm 2.7	—	—
	No client newsletter	12.7 \pm 2.0	—	—

See Table 3 for remainder of key.
LSM = Least squares mean.

Discussion

Business management is an important component of long-term veterinary practice sustainability. Specific business management techniques and practice demographics vary on the basis of species focus,^{1,8} and the objective of the study reported here was to evaluate potential relationships between these factors and size and growth in rural mixed-animal veterinary practices. Identification of specific factors that influence practice size and growth is valuable for private practitioners desiring to expand or grow their business. Several authors have described a potential shortage in rural veterinarians,^{10,17} and research into economic drivers in these practices is important for enhancing the understanding of factors associated with maintaining sustainable, growing practices.

The Web-based survey instrument used in the present study was targeted toward rural mixed-animal practitioners (AABP, AVC, and KSUCVMCE listserves). These listserves were selected because they primarily consist of the target audience of rural mixed-animal practitioners. The overall survey response rate was low, and this was likely related to both the length of the survey and the fact that several questions required specific economic figures for the practice. Apparent survey response rate may have also been impacted by the use of 3 e-mail listserves, which may have had overlapping members (all 3,410 of the survey recipients were not likely unique because they could have belonged to > 1 listserve).

Most respondents were in the target demographic of rural mixed-animal practice as indicated by the breakdown of the percentage of time spent on each species (Table 1). Practices in this survey spent a mean of 33.2% (median, 30%) of their time on small animals; therefore, the survey population could be viewed as large-animal predominant mixed-animal practices. As with any survey, the findings are most applicable to practices with characteristics similar to those of the survey participants. Respondents represent a cross section of practices with a similar NV to that indicated in other reports.^{4,8}

Although we evaluated only gross income (as opposed to net income), these variables are commonly used to describe practices and determine fair market value if the practice were to be sold.⁶ Median GPI in the survey population was similar to the median reported from a larger survey of US veterinary private practices in 2005.⁸ There also was a large range in GPI among practices within our survey population (Table 2). Therefore, although the survey population was relatively small, results are applicable to rural mixed-animal practices with characteristics similar to those of the survey population.

Practice size was evaluated by use of 3 outcomes (NV, GPI, and GPIV), and each evaluation revealed a slightly different outcome for demographic and business management factors that influenced practice size. Assessment of relationships among size outcome variables revealed that GPI increased with NV and GPIV. This result is not surprising because an increase in GPI is expected when a practice adds veterinarians and

these veterinarians are each generating more income (GPIV). Although NV was not associated with GPIV for the multivariable regression analysis, the number of associate veterinarians in a practice was highly associated with the GPIV. The number of associate veterinarians in a practice was related to NV, but NV also included the practice owners. Addition of veterinarians would not necessarily be expected to increase GPIV; however, in the study reported here, we found that for each associate added to the practice, GPIV increased by \$38,596 (Table 3). Higher GPIV in practices with more associate veterinarians could be a result of increased practice efficiencies (economies of scale) when new income generators (associate veterinarians) are added to a practice.

The number of registered veterinary technicians was an important factor positively associated with both NV and GPI. The relationship with NV could have been related to the fact that practices with more veterinarians require more support staff, and when this support staff is in place, the practice can generate more gross revenue (GPI). Of interest for the multivariable regression, both the number of associate veterinarians and the number of registered veterinary technicians were positively associated with GPI, and the estimate of their contribution to GPI was nearly equal. This finding indicated that practices should consider new associate veterinarians as a method to increase GPI, but registered veterinary technicians may also serve as a method for generating additional gross income.

Minimal differences attributable to species focus were detected in the outcomes for practice size, and this may have been related to the fact that most practices were in the same mixed-animal category. However, practices had higher GPIV when more income was derived from practicing on swine or beef. Our results are consistent with those in another study,⁸ in which differences in practice characteristics based on species type were described. Results for the 2006 AVMA Biennial Survey⁸ revealed a mean gross practice revenue of \$1,099,321 with a mean NV of 2.99, which resulted in a mean gross practice revenue per veterinarian of \$367,665 for veterinarians in predominantly large-animal practices (which would include food animal species, such as beef or swine, but not equine species). That survey also revealed mean gross practice revenue for predominantly small-animal practices of \$651,743 in 2005 with a mean of 1.85 veterinarians for a calculated gross practice revenue per veterinarian of \$352,294. The differences in GPIV described in our study and in other studies may be attributable to inherent structural and income-generating differences between practices focusing on different species. The values reported in our study were calculated on the basis of gross income and did not indicate that veterinarians in large-animal practice were generating more net income, but these findings could have been related to higher product sales associated with beef and swine resulting in a higher GPIV.

Specific business management factors were also associated with practice size, but the traits that were important varied on the basis of the measure of practice size. Practices in which veterinarians spent less time on management were associated with a higher NV. This

may not have been caused by the fact that time spent managing the practice inherently limits the NV; rather, it may indicate that when more veterinarians are employed at a practice, less time is required for veterinarians to manage the practice as a whole because these duties can be divided among several people.

Practices that varied service fees among clients had higher GPI, compared with the GPI for practices that charged the same service fees for all clients. Veterinarians have the ability to vary prices among customers, yet little research has been done on the factors that influence the strategy used for price determination.¹⁸ The value of the same service may differ among clients on the basis of their goals and economic situation, and varying prices to match demand may be a technique to optimize total revenue.

Practices employing a business manager independent of a practice owner or veterinarian had higher GPIV, compared with the GPIV for those that did not have a business manager. It is not surprising that this would improve GPIV because of the nature of a business manager's role and responsibilities to efficiently run a business while maximizing practice income. A business manager could improve GPIV by assuming the responsibility of managing a practice and allowing veterinarians more time to focus on practicing medicine and generating income. More time practicing means an ability to increase client load, which means each veterinarian would generate more income.

In addition to results for mean practice size over a 5-year period, the present study also revealed a tremendous range in practice growth as gauged by NVG, GPIG, and GPIVG. All 3 growth outcomes were positively associated, which indicated that growing practices tended to have increases in all 3 categories. The mean growth rates of the economic variables (GPIG and GPIVG) were higher than the mean inflation rate (3.0%) during the study years 2003 through 2007.¹⁹ However, economic growth rates among practices in the study were highly variable, thereby providing a range of values to distinguish growing practices from practices decreasing in size. Demographic and business management factors influenced practice growth rates, but the variables associated with growth depended on how an increase in practice size was measured.

Species focus of a practice influenced NVG, and these differences may have been associated with structural differences related to practice type rather than to specific business decisions. Although the survey population comprised mixed-animal practices, respondents were asked to select 1 area as their primary focus (ie, species of interest). Small-animal practices in our study population had higher NVG than did practices with a primary interest in beef or equine (Figure 1). The NVG associated with practices that were self-defined as small animal is not surprising given recent trends regarding the increasing demand for veterinary services, particularly in the small-animal area.²⁰ Our results identified a negative association between a primary interest in equine and NVG, and this may have been related to the fact that equine veterinarians often are solo practitioners.¹ Species focus impacted NVG, and similar to the aforementioned impact of the number of associate veterinarians

on GPI and GPIV, increasing the number of associate veterinarians could influence long-term gross practice revenues.

For all the variables evaluated, only 2 survey questions related to pricing (frequency for adjusting prices and services fees the same for all clients) were associated with GPIG in the multivariable model. We did not detect an association between frequency of reviewing financial information and overall GPI; however, this factor was associated with differences in GPIG (Figure 2). Our results differ slightly from those of a survey¹ in which investigators found that financial review was 1 of the 8 factors with the largest positive impact on income and that reviewing this information more frequently, such as monthly, was associated with higher income. Potential differences between our survey and that survey¹ are that different factors were used in the multivariable models and we monitored growth over a 5-year period in addition to gross revenues. Reviewing financial reports on a frequent basis is essential for practices to assess their financial performance and make adjustments or improvements as necessary. More frequent reviews would allow modifications to keep pace with changes in the business environment that could contribute to higher growth rates in GPI.

A higher GPIG (12.5%) was associated with adjusting service fees among clients, compared with the GPIG (8.2%) for practices that charged the same service fees to all clients. In another study,² pricing services on the basis of inherent values rather than on concerns about competitors' prices had a positive effect on income. This indicates that the value of services may be more important than competitors' prices when determining a schedule of charges for a particular practice. Results of the study reported here indicated that the same service may be of different value to the variety of clients within a practice, and adjusting service fees to match this perceived value may contribute to higher GPIG.

Communicating with clients was important for practice GPIVG because having a marketing plan and sending a client newsletter were both positively associated with this variable. Receiving a newsletter would be likely to make a client feel like a valued customer; thus, they would be more likely to bring their business to that practice. As client satisfaction increases, the business they bring to a practice may increase, which allows successful practices to increase revenue. Our findings regarding the importance of client communication parallel those in another study,¹ in which client relations was one of the factors that helped determine financial success regardless of the practice's species focus. A client newsletter could inform clients of new services, remind them of the practice's ability to meet their needs, and maintain open communication, thereby encouraging clients to contact the practice. A newsletter could also attract new clients by raising awareness of the practice and describing the types of services the practice can provide to potential clients. All of these reasons could increase the growth rate of income generated from clients.

A marketing plan details the actions necessary to attract and retain customers; however, not all practices surveyed used this technique. The positive relation-

ship between the use of a marketing plan and a higher GPIVG agrees with results of another study,⁷ in which investigators indicated that the marketing of a veterinary practice's services to potential and existing clients is essential for practice growth. Income per veterinarian is inherently related to the number of clients a practice can attract and maintain, and a marketing plan may enable a practice to more efficiently cultivate relationships with new and existing clientele.

Although the results of the study reported here provide helpful insights that could potentially benefit veterinarians in mixed-animal practice, the study does have limitations. Results from this study should be interpreted with caution because they were derived from a relatively small population of veterinarians; however, the characteristics of this population are similar to those of other rural mixed-animal practices. In addition, we analyzed factors that influence GPI, but this value does not delineate between business management techniques that influence net income or practitioner salary. The relationship between gross and net income likely varies among practices and could be influenced by practice size, species focus, business structure, and geographic location. Results from the present study indicated factors that influenced gross income (and growth), but this does not necessarily indicate a similar relationship between these variables and net income or practitioner salary.

Understanding the factors that influence practice size and growth are important to veterinarians who own or work in rural mixed-animal practices. Results of this study revealed several significant associations for practice demographic and management factors with practice size (NV, GPI, and GPIV) and growth (NVG, GPIG, and GPIVG). We found that different variables influenced each of the size and growth factors; therefore, use of specific techniques to change practice size or growth will be related to each practice's long-term goals and preferred measurement outcomes. Further studies are needed to more clearly define relationships between practice demographics and business management factors and their influence on practice net income.

- a. Copies of the survey are available from the authors on request.
- b. JMP, version 7.0.1, SAS Institute Inc, Cary, NC.

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