Incomes and satisfaction among bovine-focused veterinary practitioners in the United States and Canada

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Abstract

Veterinarians with income from bovine-focused work were invited to complete an online survey about their 2021 income, employment and demographic characteristics and their levels of satisfaction with their job and their compensation. Survey responses were solicited by the American Association of Bovine Practitioners through a newsletter and promotion to conference attendees, and by the investigators though a bovine veterinarian group on Facebook. Our objectives were to improve pay transparency for bovine-focused veterinarians and to examine how incomes and satisfaction differed based on employment and demographic characteristics. We received 623 responses from veterinarians in partly or entirely bovine-focused practice, of which 414 responses were included in analyses and reporting. Factors that are positively associated with increased income include years since graduation, practice ownership, type-exclusive practice (beef or dairy only), and a production-based compensation structure. Income transparency is positively associated with job satisfaction, while being on call and working increased hours are negatively associated with job satisfaction. Reported incomes may have been somewhat depressed due to the reporting period falling during the COVID pandemic. This information about incomes and satisfaction among bovine practitioners may encourage increased income transparency and the use of compensation structures based entirely or in part on production.

Key words: compensation, income, practitioner, satisfaction

Introduction

Since the year 2000, 71% of countries in the Organization for Economic Co-operation and Development have enacted policies to increase pay transparency.[1] In the United States, per Executive Order 11246 which was in effect from 1965 until 2025,[2,3] workers had the right to inquire about, discuss or disclose their own pay and that of other employees or job applicants without negative consequences. In California, employers with at least 15 employees must include pay scales when advertising available jobs, and 7 other states also have laws intended to increase pay transparency. Canada has both federal and provincial laws that have broadened pay transparency.

Pay transparency is more common in the public sector than in private industry, with a 2017 report indicating that compensation information is public for 70% of public employees and 17% of private employees in the U.S.[4] In 2022, according to the American Veterinary Medical Association (AVMA), 80.8% of veterinarians in the United States worked in private practice, suggesting that most veterinarians are unlikely to have access to information about the compensation of their colleagues and peers.[5] In addition, while detailed information is available annually about the compensation of veterinarians as they graduate from U.S. veterinary schools and enter the profession, similarly detailed information is not available for bovine-focused veterinarians who are not new graduates.[6]

In order to obtain information about veterinarians whose work is focused entirely or in part on bovine species, we surveyed veterinarians in bovine-focused employment about their employment and compensation characteristics, demographic information and satisfaction with their incomes and careers. The objectives of this study were to describe incomes among veterinarians who work in jobs with a bovine component and to examine relationships between income, employment and compensation characteristics, demographic attributes, and job and income satisfaction.

Materials and methods

We created a survey using a commercial survey instrument (Qualtrics) and requested the participation of any veterinarian with a job including bovine-focused work. Respondents who self-identified as having any bovine-focused component to their employment in 2021 were eligible to be included in the analyses of survey results. Respondents who self-identified as being in private practice were asked to categorize their practice caseload as dairy exclusive, beef exclusive, food animal exclusive, mixed species with food animal predominant or small animal predominant, equine predominant, in vitro fertilization (IVF)/embryo transfer exclusive, or other (specify). These categories were chosen in order to easily group practice types together and because these terms are commonly used.

Respondents were also asked to identify their location by state in the United States, province in Canada, or country if outside the U.S.; these geographic identifiers were then grouped by American Association of Bovine Practitioners (AABP) district for respondents in the U.S. and Canada. Other items in the survey included: days and hours worked per week, whether the respondent was ever on call, and compensation structure. In terms of benefits, respondents were asked to select from a list of possible benefits provided in part or in full and to indicate their employer-provided paid vacation and sick leave days per year. Additional demographically focused questions included gender, year of graduation from veterinary college, and the name of the college.

Respondents were asked to report their "total income in U.S. dollars from bovine-related veterinary work" in the year 2021, and they were asked whether they were aware of the incomes of other veterinarians in their workplace. The survey also asked respondents to indicate their level of satisfaction

with their compensation and their overall job satisfaction on a 5-point Likert scale, with 1= very dissatisfied, 2 = somewhat dissatisfied, 3 = neither satisfied nor dissatisfied, 4 = somewhat satisfied, and 5 = very satisfied. The complete survey is available from the authors upon reasonable request.

The survey was available for responses from August 29, 2022, to November 10, 2022. It was distributed via the email listserv and newsletters of the AABP (approximately 4,257 members) and to a group limited to bovine veterinarians on Facebook with approximately 9,600 members. Membership in the 2 distribution groups is expected to have significant overlap.

This project was exempted from review by the Institutional Review Board at Texas Tech University.

Statistical analyses

Initial descriptive statistics were done to summarize the important variables. Our dependent variables are income, salary satisfaction, and overall job satisfaction, while the independent variables are employment type, compensation type, district location, practice type, age, hours worked, whether on call or not, and years since graduation from veterinary school. We first performed univariable analysis between the outcome variables and independent variables, as well as among the independent variables. Due to the violation of parametric assumption, non-parametric analyses were performed. We compared dependent variables between the districts and between compensation structures (Salary, Base Salary + Production Bonus, and Production-based Compensation) using Kruskal-Wallis's test. Post-hoc analysis was further carried out using Wilcoxon Rank Sum Test adjusting for multiple comparisons using Bonferroni correction where necessary.

In order to explore the differences in compensation between women and men while adjusting for other variables including employment type, compensation type, district location, practice type, age, hours worked, whether on call or not, and years since graduation from veterinary school, we performed multivariable mixed effect linear regression analysis taking district and practice type as random effects. Both district location and practice type were taken as random effects due to hierarchical nature of the data as the practice types are nested within the district. Multicollinearity between the variables was explored using variance inflation factor (VIF). Whenever there was multicollinearity, a variable was selected to represent other collinear variables. Age and year post-graduation were collinear, therefore, year post-graduation was included in the subsequent model building process. Due to the violation of parametric assumptions of equal variance and normality, a mixed effect non-parametric robust regression model was performed to account for the violation. Interaction terms between gender, employment type and compensation type variables were investigated in the regression analysis. We used Akaike Information Criterion to select the best parsimonious model. Variables were included in the final model if they contributed to the model adequacy, irrespective of statistical significance. Regression estimates are presented as median estimates with respective robust standard errors.

Because income satisfaction and overall job satisfaction were recorded in Likert scales, we performed cumulative link model (CLM) for ordinal regression to explore the differences in salary satisfaction and overall job satisfaction between male and female veterinarians while adjusting for other variables including employment type, compensation type, district location, practice type, hours worked, whether on call or not, and years since graduation from veterinary school. Proportional odds assumption i.e. the effects of the predicting variables across all Likert categories of the outcome variables (salary satisfaction and overall job satisfaction) were investigated using likelihood ratio test for each predicting variable in the CLM as a goodness of fit test. Whenever there was a violation of proportional odds assumption, a partial proportional odds model was built, where the proportional odds assumption was relaxed for the affected variable. The CLM model estimates were presented as ordered odds ratios which reflect the increasing or decreasing odds of salary satisfaction and job satisfaction for each predicting variable in the CLM. Statistical significance was designated at $P < 0.05$ and statistical analyses were done using the R software computing environment (R version 4.4.2).

Results

Statistical means are reported here as mean ± standard deviation and medians are reported as median ± interquartile range. All monetary amounts are in United States dollars.

Six hundred twenty-three respondents indicated that their job was mostly or entirely veterinary private clinical practice. However, 96 of those respondents did not provide income information and were removed from analysis. Additionally, 6 respondents did not report their number of hours worked per week and 56 reported working less than 40 hours per week. We limited statistical analyses to those respondents who indicated working a minimum of 40 hours per week, a standard definition of "full time". Forty-eight respondents graduated in 2021 or 2022; since those respondents would not have had a full year of income in 2021, they were also removed from analyses. Last, we removed 3 participants because their reported incomes in 2021 were outliers ($7,429, $14,114 and $3 million), while the next closest incomes were $40,000 on the low end and $1 million on the high end. Thus, the sample used in the analysis represents 414 full-time, private clinical practice veterinarians.

Description of respondents

The sample consisted of 50.7% (n = 211) men and 45.9% (n = 191) women. 0.9% (n = 4) preferred not to say, and 2.4% (n = 10) did not indicate their gender. The median age of the participants was 36 years old ± 18.25 and the mean age was 41.1 years ± 12.6. The mean age of male respondents was 45.9 ± 13.8 years, while women's mean age was 36 ± 8.7 years. The top 3 Districts of the AABP represented among respondents were District 5: IL, IN, WI (15.1%, n = 63), District 9: CO, NE, NM, ND, SD, UT, WY (14.7%, n = 61), and District 6: IA, MN (10.8%, n = 45). Twelve participants did not indicate their location. Most respondents worked in smaller cities with 88.5% working in locations where the population was less than 50,000 residents; 16 participants did not answer this question.

Participants who graduated from veterinary college between 2010-2019 had the most representation (48.6%, n = 202), followed by graduates from 2000-2009 (14.7%, n = 61), graduates from 1990-1999 (10.8%, n = 45), and graduates from 1980-1989 and 2020 (each 9.1%, n = 38). Seventeen participants did not indicate their year of graduation from veterinary college. Most participants were not diplomates of any AVMA-recognized specialty college or board (93.0%, n = 387); 24 participants did not answer this question.

Most respondents reported working as a practice associate (49.0%, n = 204), followed by sole practice owner (24.8%, n = 103), partner practice owner (22.8%, n = 95), farm employment (1.7%, n = 7) and other (1.7%, n =7). The most represented focus area was predominantly food animal (beef) mixed animal practice, (19.7%, n = 82), followed by predominantly food animal (dairy) mixed animal practice, (16.6%, n = 69), food animal exclusive practice, mixed type/species (16.3%, n = 68), and mixed animal practice, predominantly small/companion animal (16.1%, n = 67).

Income, location and practice focus

Reported incomes for full time (≥ 40 hours per week) year-long employment in 2021 ranged from $40,000 to $1 million. The mean reported income was $150,531 ± 107,960.60, and the median was $120,000 ± 88,920.75.

Incomes among private practitioners varied depending on the location of the practice. The AABP district with the highest median income of $187,500 ± 74,000 per year was in District 10 (AZ, CA, HI, NV) followed by District 3 (AL, FL, GA, MS, NC, SC, TN) median $150,000 ± 43,450, and District 4 (KY, MI, OH, WV) with median $150,000 ± 90,000 per year.

There was a significant difference in median incomes among practice types (Kruskal Wallis test, $P < 0.01$). Post hoc analysis found that median salary of exclusive dairy veterinarians exceeded the food animal veterinarians ($P < 0.01$) and mixed animal veterinarians ($P = 0.03$). The median salary of the exclusively beef veterinarians exceeded the food animal veterinarians ($P = 0.02$). The median salaries among other practice types were not statistically different ($P > 0.05$).

Income transparency

Just over half of the participants (55.3%, n = 230) were aware of how much other veterinarians at their workplace were paid, while 40.1% did not know what others were paid (n = 167), and 4.6% (n = 19) did not provide any response to this question. Most participants felt that they were paid fairly in comparison to other veterinarians at their workplace (55.5%, n = 231), while 26.0% (n = 108) felt they were paid neither unfairly nor fairly by comparison, and 13.5% (n = 53) felt they were paid unfairly by comparison. Twenty-four respondents did not answer this question. Only 10.8% (n = 45) of respondents had changed jobs primarily due to issues of compensation at some point in their veterinary career. Associate veterinarians who were aware of the compensation of their coworkers reported greater satisfaction with their salary compared to associates who were not aware of the incomes of other personnel ($P < 0.01$, Wilcoxon Rank Sum test, mean 3.84 ± 1.27 vs. 3.26 ± 1.6, respectively, both median 4 ± 2). Overall job satisfaction was also higher for associates who were aware of the incomes of other veterinarians in the practice ($P < 0.01$, Wilcoxon Rank Sum test, mean 3.94 ± 1.11 vs 3.56 ± 1.11, respectively, both median 4 ±1).

Compensation structure and on-call duty

Among the 242 respondents who indicated their compensation structure, most reported that their compensation was paid as a salary (62.4%, n = 151), while 25.2% reported receiving a base salary plus production (n = 61), and 6.2% (n =15) had production-only incomes. Only 2 respondents (0.8%) were paid on an hourly basis, and 13 (5.4%) reported that their pay structure was "other" (unspecified). The median income of salary earners was $90,000 ± 28,000; salary plus production was $111,000 ± 53,500, and production-only income was $130,000 ± 47,500. There was a significant difference in median income among the compensation types (Kruskal Wallis test, $P < 0.01$). Post hoc analysis found that median salary was lower for veterinarians paid salary only compared to those paid salary plus production bonus ($P < 0.01$), and lower than those paid based only on production ($P = < 0.01$). Median incomes did not differ between the salary plus production bonus and production-based compensation groups ($P = 1.00$).

The majority of respondents for each pay structure type were associates, not practice owners (68.7% of salary-only, 55.6% of salary + production, and 67.3% of production only groups). Among the veterinarians, 91% reported being on call while 9% were not on call.

Gender, income and time

Unadjusted median income was higher for men ($150,000 ± 120,000) than women ($95,000 ± 50,000) (Wilcoxon Rank Sum test, $P < 0.01$). Median number of hours worked per week was higher for men (53 ± 10) than women (50 ± 10) (Wilcoxon Rank Sum test, $P < 0.01$). Median number of years since graduation was higher for men (15.5 ± 25.25) than women (7 ± 9), (Wilcoxon Rank Sum test, $P < 0.01$).

Unadjusted mean reported incomes were $180,211 ± 126,002 for men and $118,659 ± 76,219 for women. Unadjusted mean incomes were higher for men than for women by $61,823 (95% CI: 41,589-82,057). Table 1 reports the number of respondents and unadjusted median reported annual incomes for men and women across each decade of graduation represented in our data. In each career decade, men have numerically higher median reported incomes than women.

We performed a multivariable mixed effect linear model (with robust estimates) by taking district location and practice type as random effects to explore the gender difference in salary while accounting for other variables including employment type, compensation type, age, hours worked, whether on call or not, and years since graduation from veterinary school. We observed a significant three-way interaction between gender, employment type, and compensation type ($P < 0.01$). In other words, the salary difference between men and women varied with employment type and compensation structure. It was estimated that the median annual income of men exceeded the annual income of women among the salary-based sole-practice owners, production-based sole-practice owners, and salary-plus production-based associate veterinarians, while the median annual income of women exceeded the annual income of men among the salary-plus-production-based sole practice owners and production-based associate veterinarians (Table 2).

Practice ownership and other factors affecting income

Table 3 shows unadjusted median annual incomes for ownership status and gender categories by decade of graduation. Unadjusted median incomes were $150,000 ± 125,487 for sole practice owners, $189,000 ± 110,000 for partner practice owners, and $90,000 ± 34,250 for associates (non-practice owners).

Table 1: Unadjusted annual reported incomes for full-time practitioners in 2021 by gender and decade of earning Doctor of Veterinary Medicine degree.

Graduation year		N	Mean ($USD)	Standard deviation ($USD)	Median ($USD)	Interquartile range
1970-1979	Male	15	166,786.33	92,094.90	150,000.00	102147.50
	Female	0				
1980-1989	Male	31	206,819.10	117,621.60	185,000.00	151000
	Female	7	140,432.86	40,854.87	160,000.00	65200
1990- 1999	Male	31	227,314.55	117,318.94	189,000.00	131500
	Female	14	133,456.07	81,879.86	128,942.50	74750
2000-2009	Male	37	186,684.59	110,581.85	152,500.00	124352
	Female	24	154,052.54	99,001.72	121,630.50	58250
2010-2019	Male	79	167,829.68	147,171.25	133,000.00	95750
	Female	121	114,215.76	77,158.52	93,000.00	47750
2020	Male	15	97,086.67	19,921.95	88,000.00	28850
	Female	23	87,415.09	20,898.13	85,000.00	11000

Table 2: Pairwise comparison of incomes among men and women veterinarians by ownership status and compensation structure using a robust regression model in which the interaction of these three factors was statistically significant ($P < 0.01$). Wherever the salary difference is negative, salary of the female veterinarians exceeded the male veterinarians.

Employment type	Compensation type	Gender comparison	Salary difference	Robust standard error	*P*-value
Sole practice owner	Salary-based	Male vs Female	93,131.05	12,493.32	<0.01
	Salary plus production	Male vs Female	-82,461.70	8,209.77	<0.01
	Production-based	Male vs Female	234,222.50	3,106.40	<0.01
Partner practice owner	Salary-based	Male vs Female	129,268.30	181,263.40	0.476
	Salary plus production	Male vs Female	-21,566.50	15,235.38	0.158
	Production-based	Male vs Female	*	*	*
Practice associate	Salary-based	Male vs Female	-577.47	5,499.491	0.916
	Salary plus production	Male vs Female	29,398.21	10,209.81	0.005
	Production-based	Male vs Female	-32,238.90	8,220.52	0.01

* Only one veterinarian was a partner practice owner with production-based compensation.

Table 3: Unadjusted median ± interquartile range of incomes by gender, ownership status and decade for private practitioners (n = 389).

		1970	1980	1990	2000	2010	2020
Sole owner	Male	155,000 ±104,221.25	155,400 ±77,500	170,000 ±167,000	150,000 ±129,000	200,000 ±125,701	*
	Female	*	97,000 ±40,000	72,000 ±73,788.70	120,000 ±77,500	79,000 ±45,000	*
Partner practice owner	Male	230,000 ±45,000	252,500 ±126,250	206,000 ±84,500	187,000 ±100,000	175,000 ±112,000	*
	Female	*	173,700 ±16,607	200,000 ±92,500	127,000 ±15,000	177,500 ±88,000	*
Practice associate	Male	99,000 ±26,250	103,000 ±11,000	130,000 ±0.00	95,000 ±44,625	98,750 ±43,704	88,000 ±28,850
	Female	*	*	115,000 ±65,000	90,000 ±26,000	90,000 ±28,685	85,000 ±11,000

* Income data were excluded to preserve anonymity (n < 4 respondents)

There was a difference in median salary for the different ownership categories among the veterinarians ($P < 0.01$, Kruskal Wallis test). Post hoc analysis (Wilcoxon Rank Sum Test adjusted for multiple comparison using Bonferroni correction) revealed the median salary of the partner practice owners was higher than the sole practice owners ($P < 0.01$) and the associates ($P < 0.01$), and the median salary of the sole practice owners was higher than the associates ($P < 0.01$).

In this model, age and years since graduation were collinear in the model; therefore, years since graduation was included in the model while age was not included any further in the analysis. Every additional year post-graduation increased income by $1,133 (95% CI: 7.7-2274, $P = 0.051$). The income difference associated with being on call, $13,297, did not achieve statistical significance (95% CI: 924-27518, $P = 0.061$) . The number of hours worked per week did not affect income in the mixed effect robust regression model.

Factors associated with salary differences, salary satisfaction, and overall job satisfaction among the surveyed veterinarians

For all respondents, medians were 4.0 ± 2.0 for overall job satisfaction and 4.0 ± 3.0 for income satisfaction. Job satisfaction and income satisfaction between the genders did not differ ($P = 0.093$ and $P = 0.323$, respectively). Results of regression analysis of factors affecting job satisfaction and income satisfaction are presented in Tables 4 and 5.

In the CLM for ordinal regression for income satisfaction (Table 4), there was no statistical difference between the men and women in income satisfaction while accounting for other variables including employment type, compensation type, age, hours worked, practice type, district, whether on call or not, and years since graduation from veterinary school. Higher odds of income satisfaction were found among the veterinarians with salary-plus-production and production-only compensation structures compared to the veterinarians with salary-only compensation. Higher odds of income satisfaction were found among veterinarians from District 10 (AZ, CA, HI, NV) compared to District 1 (NY, CT, RI, VT, MA, NH, ME) and among exclusive beef veterinarians compared to exclusive dairy veterinarians.

In the CLM ordinal regression for overall job satisfaction (Table 5), there was no statistical difference between men and women in terms of overall job satisfaction while accounting for other variables including employment type, compensation type, age, hours worked, practice type, district, whether on call or not, and years since graduation from veterinary school. Higher odds of overall job satisfaction were found among the veterinarians with production-only compensation structure compared to the veterinarians with salary-based compensation. Every additional hour worked decreased the odds of overall job satisfaction, while each additional year since graduation increased the odds of overall job satisfaction. Higher odds of overall job satisfaction were found among the exclusive beef veterinarians and "other" practice type compared to the exclusive dairy veterinarians. Being on call decreased the odds of overall job satisfaction compared to the veterinarians not on call. In addition, higher odds of overall job satisfaction were found among veterinarians from District 8 (TX, MS, LA) and District 10 (AZ, CA, HI, NV) compared to veterinarians from District 1 (NY, CT, RI, VT, MA, NH, ME).

Discussion

In this survey we found that a number of factors influenced incomes among veterinary practitioners with a bovine-focused aspect to their job, including an interaction among gender, practice ownership status, and compensation type. Across practice types and ownership status, having an income based entirely or in part on production incentives resulted in higher income, and in some cases mean incomes with a production-based component were higher for women than for men. This finding is consistent with studies of physician compensation in which the establishment of objective pay systems structured around measures of work output, clinical role, specialty, and/or other factors has been found to decrease or eliminate the pay gap between men and women.[7,8] In addition to being associated with higher incomes, production-based

Table 4: Results of regression analysis of factors affecting satisfaction with income among bovine-focused veterinary practitioners.

Variable	Odds ratio	95% Confidence interval	*P*-value
Hours worked per week	0.97	0.94, 1.01	0.20
Ownership status			
Sole practice owner	Reference		
Partner practice owner	3.37	0.64, 18.1	0.15
Associate	1.30	0.45, 3.78	0.60
Gender			
Male	Reference		
Female	1.61	0.88, 2.97	0.12
Compensation structure			
Salary only	Reference		
Base salary + production	2.20	1.15, 4.25	0.02
Production only	4.62	1.57, 13.9	0.06
On-call duty			
No	Reference		
Yes	0.83	0.34, 2.04	0.70
Practice type			
Dairy exclusive	Reference		
Beef exclusive	5.85	1.05, 34.4	0.05
Food animal	1.03	0.39, 2.69	0.90
Mixed animal	1.33	0.60, 3.00	0.50
Other	3.18	0.83, 12.5	0.09
Embryo transfer	0.75	0.12, 4.55	0.80
AABP district location of practice			
1	Reference		
2	0.36	0.09, 1.42	0.14
3	0.50	0.07, 3.95	0.50
4	0.56	0.14, 2.17	0.40
5	0.59	0.18, 1.89	0.40
6	0.49	0.14, 1.63	0.20
7	0.57	0.15, 2.16	0.40
8	1.05	0.17, 6.52	0.90
9	0.58	0.17, 1.92	0.40
10	7.79	1.18, 70.7	0.04
11	0.47	0.12, 1.85	0.30
12	0.86	0.17, 4.49	0.90
13	0.62	0.12, 3.19	0.60

Table 5: Results of regression analysis of factors affecting overall job satisfaction among bovine-focused veterinary practitioners.

Variable	Odds ratio	95% Confidence interval	*P*-value
Hours worked per week	0.94	0.90, 0.97	0.01
Years since graduation	1.03	1.00, 1.06	0.02
Employment type			
Sole practice owner	Reference		
Partner practice owner	1.42	0.26, 7.72	0.70
Associate	0.52	0.18, 1.54	0.20
Gender			
Male	Reference		
Female	1.32	0.71, 2.45	0.40
Compensation type			
Salary	Reference		
Base salary + production	0.93	0.48, 1.80	0.80
Production	7.55	2.25, 26.9	0.01
On call			
No	Reference		
Yes	0.22	0.08,0.59	0.03
Practice type			
Dairy exclusive	Reference		
Beef exclusive	13.2	2.55, 74.4	0.02
Food animal	2.17	0.81, 5.82	0.12
Mixed animal	1.25	0.53, 2.89	0.60
Other	4.49	1.14, 18.2	0.03
Embryo transfer	2.77	0.44, 17.3	0.30
AABP district location of practice			
1	Reference		
2	0.57	0.14, 2.24	0.40
3	1.16	0.13, 10.8	0.90
4	1.39	0.35, 5.57	0.60
5	1.06	0.32, 3.47	> 0.90
6	1.21	0.35, 4.20	0.80
7	1.71	0.45, 6.52	0.40
8	11.5	1.36, 124	0.03
9	1.37	0.40, 4.68	0.60
10	6.67	1.01, 48.0	0.05
11	1.76	0.45, 7.10	0.40
12	0.25	0.03, 2.11	0.20
13	2.05	0.40, 10.8	0.40

compensation was associated with higher income satisfaction and higher job satisfaction compared to salary-only pay structures. Pay *without* a production-based component was the most common type among our respondents; perhaps both incomes and satisfaction among bovine practitioners would be increased by broader adoption of production-based compensation structures.

Practitioners who worked full time reported working, on average, at least 50 hours per week. Working additional hours per week (beyond 40) was not associated with increased income, but it was associated with decreased job satisfaction. Being on call as a part of employment was also associated with lower levels of job satisfaction compared to practitioners who were never on call. Other factors associated with increased job and/or compensation satisfaction included more years since graduation, more years in the current job, and practice ownership; these factors were also associated with higher incomes. Increased satisfaction over time may be, in part, due to attrition of unsatisfied veterinarians from bovine-focused practice. Beef-exclusive practitioners had the highest incomes and highest levels of satisfaction among the practitioners we surveyed. Overall median satisfaction with both income and job among all respondents was better than neutral, with medians of 4 for both ("somewhat satisfied") on the 5-point Likert Scale.

In contrast to the 17% rate of pay transparency reported for the U.S. private sector overall,[4] most of the associate veterinarians who responded to this survey were aware of the incomes of their coworkers. For the respondents to this survey, awareness of the incomes of other employees was positively associated with the associates' satisfaction with their compensation and with their job as a whole. This correlation of pay transparency with increased satisfaction may be seen as encouragement to increase the prevalence of pay transparency.

There are few previous published studies of income specifically among bovine-focused practitioners. A survey-based study of veterinarians (not specifically bovine-focused) published in 2021 by Neill et al found that incomes among men were higher than those of women early in their careers, and that practice ownership was most beneficial for women as partner owners, not as sole owners.[9] This is congruent with our findings that in their first year of full-time practice, men had higher unadjusted incomes than women, and that female partner practice owners had higher incomes than female solo practice owners. The effect of pay structure on incomes was not examined by Neill et al. Similarly to our study, they found that unadjusted incomes are higher for men than for women across career stages.

It was not an objective of this study to determine what psychosocial phenomena might influence the higher unadjusted pay rates for men compared to women in bovine veterinary practice; we only investigated demographic and career-related factors. Fajt et al (2021)[10] found that some practitioners believe that practices do not want to hire women for various reasons including religious beliefs in the practice, women being perceived as physically weak and at risk of pregnancy and childbearing, and concerns that clients prefer male veterinarians. These reasons could be responsible for some of the differences in pay we observed between men and women in bovine practice, though an investigation of this possibility was beyond the scope of this project and consequently we report no data that could support or refute this notion.

The AVMA regularly publishes income data regarding veterinarians in the United States, for example in the 2023 AVMA Report on the Economic State of the Veterinary Profession.[11] In that publication, annual incomes for 2021 are reported for Food Animal (exclusive), Mixed, and Companion Animal (predominant) practices, among other categories. Because food animals include swine, poultry, aquatic species, and others, the income data reported regularly by the AVMA represents a different population of practitioners than the current study does. This same difference exists when considering comparison of the current study with AVMA publications regarding new graduates,[12] as the AVMA publications use the same categories not specific to bovine practice.

A study published in 2020 using survey data from 272 veterinarians with at least 50% bovine practice identified 4 factors that affected incomes: years since graduation, a higher number of animals seen, hours worked per week, and practice ownership.[13] This study is in agreement with our findings regarding the correlation of practice ownership and years since graduation with income. We did not query number of animals seen. We did not find an effect of hours worked per week on income as they did; however, their study included people working part time (as few as 2 hours per week) and we only analyzed responses from practitioners working at least 40 hours per week. This difference in findings is supported by the study by Neill et al,[9] in which working more hours increased income when fewer total hours per week were worked, but the effect dissipated as the hours worked per week increased.

The study reported here has strengths and limitations. It is difficult to determine exactly how many people work as veterinarians in bovine-focused veterinary medicine in the U.S. and Canada. The AVMA estimated that there were 8,279 veterinarians in food animal exclusive, food animal predominant, or mixed animal practice in the United States in 2020;[14] however, some of those veterinarians worked with food animal species other than cattle such as swine, fish, bees or poultry. Our number of responses (n = 623) constitutes 7.5% of the estimated population of U.S. practitioners in food-animal focused practice including those focused on non-bovine food animals. However, we did remove some respondents from our analyses due to failure to report their income or other factors. We had a broad and relatively even geographical distribution of respondents in the United States and Canada. As with other survey-based work, limitations of the study include the possibility of meaningful differences between respondents and non-respondents and the possibility that respondents were intentionally or unintentionally inaccurate in their responses. Finally, it must be borne in mind that respondents were asked to report on their incomes in 2021, during which time the global COVID pandemic was having economic effects that may have depressed incomes, especially for early-career veterinarians.

In summary, across decades men reported higher unadjusted mean incomes than women in full-time veterinary practice with a bovine component. Gender differences in income varied with practice ownership status and pay structure, and pay structures involving production incentives were associated with higher incomes for women than men in some circumstances. For full-time practitioners, job satisfaction and/or income satisfaction increased with years since graduation, production-based compensation structure, pay transparency among associate veterinarians, and practice ownership. Job satisfaction decreased with increased hours worked per

week and being on call. These findings may provide some encouragement for the implementation of pay structures based in part or in full on productivity measures and decrease concerns about negative consequences of pay transparency among associate veterinarians.

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