

Veterinary dairy herd fertility service provision in seasonal and non-seasonal dairy industries – a comparison.

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ABSTRACT

The decline in dairy herd fertility internationally has highlighted the limited impact of traditional veterinary approaches to bovine fertility management. Three questionnaire surveys were conducted at buiatrics conferences attended by veterinary practitioners on veterinary dairy herd fertility services (HFS) in countries with a seasonal (Ireland, 47 respondents) and non-seasonal breeding model (The Netherlands, 44 respondents and Portugal, 31 respondents). Of the 122 respondents, 73 (60%) provided a HFS and 49 (40%) did not. The majority (76%) of all practitioners who responded stated that bovine fertility had declined in their practice clients' herds with inadequate cow management, inadequate nutrition and increased milk yield as the most important putative causes. The type of clients who adopted a herd fertility service were deemed more educated than average (70% of respondents), and/or had fertility problems (58%) and/or large herds (53%). The main components of this service were routine postpartum examinations (95% of respondents), fertility records analysis (75%) and ultrasound pregnancy examinations (69%). The number of planned visits per annum varied between an average of four in Ireland, where breeding is seasonal, and 23 in Portugal, where breeding is year-round. The benefits to both the practitioner and their clients from running a HFS were cited as better fertility, financial rewards and job satisfaction. For practitioners who did not run a HFS the main reasons given were no client demand (55%) and lack of fertility records (33%). Better economic evidence to convince clients of the cost-benefit of such a service was seen as a major constraint to adoption of this service by 67% of practitioners.

KEYWORDS: Reproductive management, questionnaire survey, veterinary services

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A herd fertility service (HFS) is considered a basic component of modern herd health service provision in dairy industries internationally (Mee, 2007). A HFS may be defined as a proactive, routine service provided to manage all aspects of bovine fertility, usually by a veterinary practitioner, with emphasis on the herd as the unit of interest, rather than the fertility of the individual animal. The approach is heuristic as well as algorithmic. It is usually provided on an appointment basis, rather than as part of an emergency call, with visits scheduled at appropriate times relative to the herd breeding pattern. The HFS may be part of a larger herd health service provided by the veterinarian (Watson, 2009). While

planned animal health and production has been promoted in Ireland for many years (Keane 2009, Monaghan, 1984, Mulligan et al., 2006), the level of adoption in veterinary practice is unknown. The models of veterinary HFS provision are quite diverse between dairy industries internationally, often with little communication of ideas or practices between commercial service providers. For example, pharmacological intervention services to achieve pregnancies may be a routine practice on many North American dairies (Lauderdale 2006) but not in many European dairy herds (Chastant-Maillard 2006). Within Europe, contrasting dairy herd management systems operate in different countries resulting in different,

Table 1: Dairy herd fertility problems encountered by veterinary practitioners in Ireland, The Netherlands and Portugal (responses in %*).

	All veterinary respondents (n=122)	Veterinary practitioners in Ireland (n=47)	Veterinary practitioners in the Netherlands (n=44)	Veterinary practitioners in Portugal (n=31)
Has dairy herd fertility declined in your practice?				
Yes	76.2	80.9	88.6	51.6
No	13.1	0	2.3	48.4
Don't know	10.7	19.1	9.1	0
Why do you think this is?				
Inadequate dairy cow management	20.5	19.1	25	16.1
Increased milk yield	18.9	23.4	15.9	16.1
Inadequate dairy cow nutrition	18.9	21.2	9.1	29.0
Increased genetics for milk yield	15.6	21.2	9.1	16.1
Increased dairy herd size	9	6.4	18.2	0
Increased disease in dairy herds	4.9	6.4	4.5	3.2
Don't know	17.2	14.9	31.8	0
What are the main fertility problems you encounter in dairy herds?				
Poor oestrus detection	73.8	55.3	90.9	77.4
Puerperal problems	64.8	80.9	59.1	48.4
Repeat breeders	64.8	59.6	54.5	87.1
Poor conception rates	56.5	66.0	38.6	67.7

*Each % figure represents the percentage of respondents who provided this answer and as each respondent could provide multiple responses within some questions, the total % for each question does not necessarily add up to 100%.

largely undocumented, approaches to dairy herd fertility management. This variation in HFS between countries was the motivation for the international surveys reported here. The objective was to elicit veterinary practitioners' views on HFS provision within Ireland and to compare this with two contrasting dairy industries; The Netherlands and Portugal. In Ireland, the majority of dairy cows calve seasonally, primarily in the spring, and are bred in a low-cost, pastoral management system with emphasis on grassland management, and farmer-led fertility management predominates. In The Netherlands and in Portugal, the majority of dairy cows calve all-year-round and are bred in a confinement management system with emphasis on total mixed ration and limited pasture access, and veterinarian-led fertility management is practiced. It was hypothesised that HFS provision would differ substantially between these two contrasting dairy management systems with less emphasis on a planned HFS in Ireland and more focus on such a service in The Netherlands and Portugal.

MATERIALS AND METHODS

A questionnaire was designed and pilot-tested with veterinary delegates at two veterinary conferences in The Netherlands and Scotland. Following discussion with respondents and analysis of the responses the questionnaire was re-drafted and distributed among veterinary delegates at three buiatrics conferences in Ireland (Cattle Association of Veterinary Ireland Annual Conference), The Netherlands (Proveto Annual Bovine Conference) and Portugal (Jornadas Da Associacao Portuguesa De Buiatria). The questionnaire included questions on fertility problems encountered by veterinary practitioners in their dairy clients' herds; whether the vets provided a HFS; how the vets started this service; how

they promoted this service; the type of client who uses this service; how the vets charged for this service; the components of the service and the benefits to themselves and to their clients. For veterinary practitioners who did not provide a HFS there were questions on why they did not provide this service, if they wanted to provide this service and what would assist them in providing a HFS. These questions are listed in **Tables 1-3**. Descriptive statistical analysis of the questionnaire results was conducted using Excel (Microsoft Office, 2003, USA).

RESULTS

A total of 122 veterinary practitioners, 47 in Ireland, 44 in The Netherlands and 31 in Portugal, completed the questionnaire. Of these, 73 respondents (60%) - of which 12 were in Ireland (26%), 40 were in The Netherlands (91%) and 21 in Portugal (68%) - provided a HFS and the other 49 respondents did not. The mean (min-max) dairy herd size in the respondents' practices was 57 (20-150) in Ireland, 77 (45-110) in The Netherlands and 221 cows (10-2,500) in Portugal.

The responses from veterinary practitioners who did or did not provide a HFS in the three countries are shown in **Table 1**. The majority (76%) of respondents in each country stated that dairy herd fertility had declined in their practice. This decline in herd fertility was not attributed to a single factor, rather it was attributed to numerous factors of which inadequate management of dairy cows (21% of respondents), increased milk yield (19%) and inadequate nutrition of dairy cows (19%) were the most common contributory factors listed. The main fertility problems encountered in dairy herds were similar in each country but their ranking differed; puerperal problems were ranked as the main reproductive problem in Irish dairy herds but

as the least important problem in Portuguese dairy herds. In the latter country, repeat breeder cows were the main fertility problem encountered by veterinary practitioners. The details of the HFS provided in each country are listed in **Table 2**. In the majority of cases (73% of respondents) the veterinary practitioner started providing the service because clients requested it. The majority of respondents indicated that the type of client using this service was more educated than average (70%) and/or had a herd fertility problem (58% of respondents). The majority of vets (86%) promoted their HFS by telling their clients about the service. The number of clients using a HFS was increasing across countries (71% of respondents). Demonstrating the fertility improvements and financial gains accruing from this service were the primary methods of showing clients the benefits of a HFS. The two main benefits to the veterinary practitioner or his or her practice were the financial rewards and the satisfaction in providing a good veterinary service. Some components of the HFS differed markedly between countries; pregnancy examination by ultrasound (92% and 90% of Irish and Dutch respondents, respectively, vs 14% of Portuguese respondents), blood metabolite/mineral profiling (67% and 53% vs 24%) and AI auditing (0% and 8% vs 38%). Pregnancy examination by ultrasound was the most common component of HFS provision in Ireland (92% of respondents) while postpartum examinations were the most common component in Portugal (100%) and in The Netherlands (98%). In Ireland and in Portugal fertility records were most commonly available in notebooks and farm diaries while in The Netherlands records were most frequently available on the farmer's computer. The number of planned visits per year was substantially higher in Portugal (23) than in Ireland (4). The fee payment structure differed markedly between countries with the majority of Irish and Dutch veterinary practitioners charging per hour for this service (100% and 90% of respondents) while in Portugal the majority (57%) of vets charged a monthly fee. The majority of respondents in The Netherlands intended to provide an extended and enhanced HFS but not in Ireland or in Portugal. The three main factors which would facilitate veterinary practitioners in providing a better HFS were better economic evidence to convince clients of the benefits of this service, allocating more time to concentrate on dairy herd fertility work and better fertility data provision.

The responses about HFS provision from veterinary practitioners who did not provide such a service are listed in **Table 3**. The most common reasons given for not providing this service were the lack of client demand (55% of respondents) followed by a lack of fertility records (31%). The majority (80%) of veterinary practitioners who did not provide a HFS wished to do so. They responded that the three main factors which would facilitate provision of such a service in their practice were allocating more time to concentrate on dairy herd fertility work (74% of respondents), better economic evidence to convince clients of the service benefits (67%) and better fertility data availability (63%).

DISCUSSION

The majority of veterinary practitioners agreed with the general consensus in the peer-reviewed literature (Ireland; Mee, 2004, Portugal; Rocha and Carvalheira, 2007, The Netherlands; Veerkamp and Beerda, 2007) that dairy herd fertility has declined. This implies that successful bovine fertility management is now more critical than ever to profitable dairy farming. The respondents indicated that inadequate dairy cow management and nutrition and increased milk yield are the factors which need to be addressed in order to improve bovine fertility. The variation in the ranking of the three most common fertility problems highlighted reflects the differences between countries in both breeding patterns (seasonal vs year round) and cow accommodation (at pasture vs housed).

The most receptive clients to provision of a veterinary herd fertility management service were those with larger herds having a fertility problem. These findings correspond well with the results of a survey conducted in the UK by Wassell and Esslemont (1992a) in which they found that the type of farmer who joined a herd health scheme was generally better educated and had a larger herd with a fertility problem. The increasing number of clients availing of a HFS in each country may reflect the importance dairy farmers now place on herd fertility performance, given the decline in herd fertility, and the response by veterinary practitioners to this demand. The components of a HFS differed between countries. In Ireland there was more emphasis on use of ultrasound for pregnancy examinations and blood metabolite and mineral profiling and less on routine postpartum examinations, fertility records analysis and AI auditing. This may be due to the recent increased availability of less expensive veterinary ultrasound equipment and the variable nutritional inputs of dairy cows at pasture. While, in general, fertility records were most commonly available through client PCs, in Ireland, practitioners primarily used farmers' breeding charts and notebooks. This may be due to the relatively low level of computerised milk and fertility records (30% of dairy herds) in Ireland. The number of HFS visits per year was much lower in Ireland (on average four visits) where breeding is seasonal, compared to The Netherlands and Portugal, where breeding is non-seasonal and postpartum examinations are routinely carried out. The fee structure in Ireland was primarily fee per hour or per cow, but in the Netherlands it was mainly fee per hour and in Portugal fee per month or per cow. These differences may reflect traditional charging practices within these different industries. The fee charged per hour was quite variable both between and within countries while the fee per cow tended to be more uniform. Fees in Ireland were intermediate between those in The Netherlands and in Portugal.

Practitioners in Ireland responded that they needed more time to spend on a HFS in order to provide a better service. This reflects the busy seasonal nature of veterinary practice work in Ireland. While in The Netherlands respondents emphasised the need for better

Table 2: Details of the herd fertility service (HFS) provided by veterinary practitioners in Ireland, the Netherlands and Portugal (responses in % unless otherwise stated*).

	All veterinary respondents (n=73)	Veterinary practitioners in Ireland (n=12)	Veterinary practitioners in The Netherlands (n=40)	Veterinary practitioners in Portugal (n=21)
How do you get a HFS started with a client?				
The client asks for it	72.6	66.6	77.5	66.6
It begins with a fertility problem	71.2	75.0	70	71.4
It begins with a financial problem	21.9	33.3	17.5	23.8
Other	32.9	33.3	42.5	14.3
What are the components of the HFS you provide?				
Routine postpartum examinations	94.5	75.0	97.5	100
Fertility records analysis	75.3	58.3	77.5	81.0
Ultrasound pregnancy examinations	68.5	91.6	90	14.3
Investigation of herd fertility problems	56.2	75.0	52.5	52.4
Blood metabolite and mineral profiling	46.6	66.6	52.5	23.8
Farm staff training in reproductive skills	41.1	41.6	20	81.0
Oestrus synchronisation	34.3	58.3	10	66.6
Providing written fertility SOPs	34.3	41.6	20	57.1
AI auditing	15.1	0	7.5	38.1
Other	53.4	58.3	37.5	81.0
In what form are fertility records available to you				
Client's computer	76.7	58.3	77.5	85.7
Breeding charts	56.2	75.0	57.6	42.9
Notebooks/diaries	52.1	75.0	27.5	85.7
Other	9.6	33.3	7.5	0
How many planned HFS visits per year do you conduct?				
Mean (sd; min.-max.)	4-23	4 (2;2-6)	12 (1.4;8-15)	23 (17; 2-52)
How do you charge for this service?				
Fee/hour	68.5	100	90	9.5
Fee/cow	37	66.6	20	52.4
Fee/month	21.9	0	10	57.1
Other	19.2	0	12.5	42.9
What do you charge for this service?				
Fee/hour [€ mean (sd; min.-max.)]	87.5-106	101 (34; 60-150)	106 (13.6;80-140)	87.5 (17.7; 75-100)
Fee/cow [€ mean (sd; min.-max.)]	2-15.5	4 (1; 3-5)	15.5 (3.2;12-19)	2 (1; 1.5-3)
Fee/month [€ mean (sd ; min.-max.)]	355	-	-	355 (196; 125-650)
Describe the types of clients who use this service?				
More educated than average	69.9	75.0	67.5	71.4
Clients with herd fertility problems	57.5	66.6	57.5	52.3
Clients with larger than average herds	53.4	41.6	55	57.1
Clients who attend agricultural meetings	50.7	58.3	52.5	42.9
Clients with seasonal calving herds	19.2	58.3	17.5	0
Other	15.1	16.6	10	23.8
How do you promote this service?				
I tell my clients about it	86.3	83.3	90	81.0
Word-of-mouth between clients	16.4	33.3	7.5	23.8
Other	41.1	41.7	57.5	9.5
Is the number of clients using this service increasing?				
Yes	71.2	66.6	72.5	71.4
No	28.8	33.3	27.5	28.6
How do you demonstrate the benefits of this service?				
Fertility benefits	86.3	91.7	77.5	100
Financial benefits	69.9	66.6	62.5	85.7
Other	45.2	58.3	60	9.5
What are the benefits to your clients of this service?				
Financial	43.8	41.6	25	81.0
Satisfaction in fertility management	37	25	40	38.1
Other	19.2	8.3	32.5	0
What percentage of herds on the service has improved fertility?				

Table 2 (continued)

Mean (sd; min.-max.)	41-81	81 (17; 50-100)	41 (23.2; 0-75)	75 (21; 20-100)
What are the benefits to you/your practice from this service?				
Financial	54.8	66.6	52.5	52.4
Job satisfaction	42.5	66.6	30	52.4
Other	31.5	66.6	37.5	0
Do you want to provide an extended/enhanced service?				
Yes	71.2	41.7	95	42.9
No	28.8	58.3	5	57.1
What would assist you in providing a better HFS?				
Better economic evidence to convince clients	61.6	41.6	77.5	42.9
More time to concentrate on herd fertility	54.8	58.3	62.5	38.1
Better fertility data provision	52.1	41.6	60	42.9
A fertility referral service I could consult	12.3	33.3	32.5	9.5
Other	52.1	8.3	77.5	28.6

*Each % figure represents the percentage of respondents who provided this answer and as each respondent could provide multiple responses within some questions, the total % for each question does not always add up to 100%.

economic evidence to convince clients of the need for this service. Interestingly, a recent Danish study showed that while veterinarians believed that farmers primarily focus on production and profit, farmers valued teamwork more (Kristensen and Enevoldsen, 2008). This highlights the need for good communication with the client through a relationship-centred approach rather than a paternalistic approach (Moffett, 2009).

Despite the benefits described here by respondents for both the veterinary practitioner and his or her clients of a HFS - primarily financial and personal satisfaction - many practitioners, mainly in Ireland, did not provide a HFS. The main reasons listed for this were lack of client demand, lack of fertility records, lack of specialisation in bovine fertility work and lack of time to devote to this particular service. Regarding client demand in Ireland, farmers tend to call the veterinarian to solve problems rather than to build best practice. This may apply particularly with older, more conservative clients with family-run small herds where contact-hours per cow are still high. Paradoxically, other clients do not demand a change in veterinarian services because they are doing much of this work themselves, are employing para-veterinarians or are using natural service bulls, roll-over cows and high culling to mask poor fertility. However, where farmers are using a herd health and production management (HHPM) service, as in The Netherlands, routine reproductive monitoring is by far the most popular service (Lievvaart et al., 2008). This implies that if clients can be persuaded to try veterinary-led herd health management, a bovine fertility service is a core component.

Some veterinarians may lack the confidence and the competence to provide a specialised fertility management service even when there is a client demand. Specialised fertility work may be seen as physically demanding and too complex to yield answers which can be sold to clients. This may be particularly true in small practices where the need to provide a service across species overrides the need to specialise in bovine theriogenology. For example, in Ireland, 45% of veterinary practitioners are in practices with one or two vets (according to Damien O'Donoghue, Pfizer, through

personal communication). This hypothesis is supported by findings in the UK, where Wassell and Esslemont (1992b) found that the size of the veterinary practice was the most significant factor determining whether a practice was likely to run a herd health scheme. Devoting extra time to bovine fertility management can be a problem for practitioners with a multi-species traditional 'fire brigade' case load or who earn a substantial proportion of their income from the state through veterinary meat inspection and disease eradication schemes. The latter work yields a higher income per hour than fertility work; hence the opportunity cost of such time is also higher. However, such non-clinical income streams may come under threat with economic recessionary pressures leading to increased engagement of non-veterinarians in such work. In this scenario, veterinary practitioners may need to sell themselves more aggressively as unique herd health and fertility service providers. The findings reported here are the responses contributed on questionnaires, not an audit of what actually happens in the respondents' practices. In addition, one must be cognisant of sample size and bias in the responders versus the eligible population. In the present surveys, the sample size was limited by the attendees who responded at the conferences. Practitioners who attend conferences may not be representative of those who do not attend conferences, the former possibly being more likely to be more progressive and early adopters of new information and technologies. These limitations in the study design must be recognised when interpreting the survey results.

CONCLUSION

In conclusion, these surveys showed that, in Ireland, a minority of respondents provided a HFS while, in The Netherlands and Portugal, a majority did so, in agreement with the study hypothesis. The reasons suggested for this were a lack of client demand, the seasonal nature of veterinary work and the small size of veterinary practices in Ireland. The primary constraints, cited by respondents to provision of a HFS were lack of economic evidence to convince clients and lack of time to focus on this type of

Table 3: Responses of veterinary practitioners who did not provide a herd fertility service (HFS) in Ireland, The Netherlands and Portugal (responses in % *).

	All veterinary respondents (n=49)	Veterinary practitioners in Ireland (n=35)	Veterinary practitioners in The Netherlands (n=4)	Veterinary practitioners in Portugal (n=10)
Why do you not provide a HFS?				
No client demand	55.1	62.9	25	40
Lack of fertility records	32.7	42.9	0	10
I'm not specialised in fertility	30.6	25.7	0	60
I'm too busy with other work	30.6	28.6	25	40
I can't justify the cost:benefit to clients	22.5	25.7	25	10
This service is already provided by a competing vet/other	14.3	8.6	25	30
It wouldn't pay me as well as my other work	10.2	11.4	0	10
I don't see the need for it	2	0	0	10
Other	0		0	
Do you want to provide a HFS?				
Yes	79.6	82.9	25	90
No	20.4	17.1	75	10
What would assist you in providing a HFS?				
More time to concentrate on herd fertility	73.5	74.3	25	90
Better economic evidence to convince clients	67.3	74.3	25	60
Better fertility data provision	63.3	65.7	25	70
A fertility referral service that I could consult	46.9	54.3	25	30
Other	38.8	42.9	25	30

*Each % figure represents the percentage of respondents who provided this answer and as each respondent could provide multiple responses within some questions, the total % for each question does not necessarily add up to 100%.

work. Without promotion within the veterinary profession that addresses these identified barriers and drivers to adoption, little change in current fertility service provision can be expected in Irish veterinary practice. However, given the recent emphasis on problem-based learning for veterinary undergraduates in Ireland, the provision of veterinary services may be quite different in the future as the profession endeavors to remain relevant in an increasingly crowded marketplace.

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