EFFECTIVENESS OF TEAT COVERAGE WITH POST MILKING TEAT DISINFECTANT USING A VACUUM OPERATED TEAT SPRAY SYSTEM

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INTRODUCTION

Complete teat coverage with the post milking teat disinfectant is essential in any mastitis control programme. Besides the bacteriocidal action on the teat surface and orifice, it is essential that all teat skin is kept as soft and as supple as possible to withstand the rigours of milking. There are an ever increasing number of automatic teat spraying systems available to dairy farmers, and ideally any such system will provide 100% teat barrel and teat end coverage, 100% of the time. But is this realistic? What is the coverage with manual teat spraying for comparative purposes?

The objective of this study was to measure post milking teat barrel and teat end coverage when manual spraying with disinfectant.

EVALUATION METHOD

Teat barrel and teat end coverage were assessed post application of the teat disinfectant product on ten farms, each with a minimum of 150 cows.

Farm	Parlour type	Parlour configuration	Number of operators (O –owner; E – employee)	Number of operators spraying	Cows in herd	Cows in milk	Number of cows scored
1	Rapid exit	32:32	2 (1xO, 1xE)	1 (E)	270	235	191
2	Rotary	40	3 (3xO)	1 (O)	360	400	162
3	Herringbone	16:16	1 (E)	1 (E)	155	130	174
4	Herringbone	20:20	1 (E)	1 (E)	190	170	165
5	Herringbone	24:24	2 (2xE)	2 (E)	300	275	202
6	Herringbone	16:32	1.5 (1xO,0.5xE)	1 (O)	150	130	159
7	Herringbone	16:32	2 (2xO)	2 (O)	170	145	145
8	Herringbone	20:20	1 (1xE)	1 (E)	210	180	160
9	Herringbone	32:32	2 (2xE)	2 (E)	300	250	155
10	Rotary	50	3 (2xE,1xO)	1 (O)	450	400	152

To assess barrel coverage, the front and back of the teat was scored as a maximum of 50, i.e. if all one teat side was completely covered this equated to 50 (100% coverage of that plane), whereas a score of 25 meant that only half of that plane was covered in chemical. If both sides of the teat barrel were completely covered this equates to 100% teat barrel coverage.

Teat end coverage was assessed as either covered or not covered (hit or a miss). The volume of teat disinfectant product applied during the monitored milking was measured and a calculation of chemical usage / cow / milking was made.

RESULTS

Table 1. Teat end and teat barrel coverage with disinfectant

Farm Number	Average Number - Teat end coverage	Number for No teat end coverage	Number of missing quarters	Barrel Average % for Left teats	Barrel Average % for Right teats	Barrel Average % for Rear teats	Barrel Average % for Front teats	Barrel Average % for All teats
1	3.93	10	3	54.12	54.20	55.62	52.85	54.20
2	3.93	6	5	49.22	48.71	50.38	47.67	48.99
3	3.99	2	0	81.72	85.01	86.19	80.55	83.37
4	3.99	0	1	82.23	79.85	85.97	75.98	81.02
5	3.51	97	1	32.62	32.98	33.53	32.05	32.80
6	3.96	3	4	33.13	33.36	33.82	32.64	33.24
7	4.00	0	0	36.57	36.43	37.84	35.16	36.50
8	3.20	127	1	18.67	20.96	20.67	18.93	19.80
9	3.37	91	6	45.77	46.42	50.16	41.97	46.09
10	3.81	29	0	66.55	67.47	69.87	64.14	67.01
STUDY AVERAGE	3.77	36.5	2.1	50.06	50.54	52.41	48.19	50.30
Minimum	3.20	0.00	0.00	18.67	20.96	20.67	18.93	19.80
Maximum	4.00	127.00	6.00	82.23	85.01	86.19	80.55	83.37

Table 2. Percentage teat end coverage

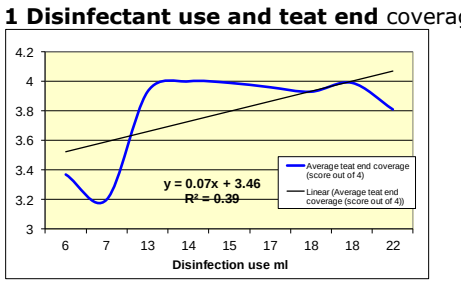
	Rear Left	Front Left	Front Right	Rear Right	Average
Teat end only covered	95.5	92.2	94.2	96.2	**94.5**
No teat end coverage	4.5	7.8	5.8	3.8	**5.5**
No teat *	0.3	0.5	0.4	0.1	**0.3**

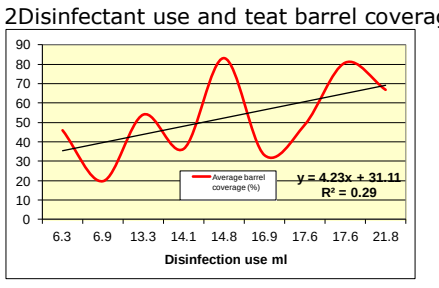
*** three quartered cow and/or unit not applied**

Table 3. Teat barrel coverage

	Rear Left		Front Left		Front Right		Rear Right	
	Back	***Front***	***Back***	***Front***	***Back***	***Front***	***Back***	***Front***
Average teat coverage (score out of 50)	42.9	21.9	42.0	17.5	42.1	18.5	43.3	21.9
No barrel coverage (number)	7.1	40.9	8.3	60.2	6.6	58.2	6.2	42.7
Average number of cows scored	166.1		165.7		166.0		166.4	

Figure 1 Disinfectant use and teat end coverage Figure 2Disinfectant use and teat barrel coverage





Statistically, the data suggests (Figure 1) no strong correlation (R^2 = 0.39) between disinfection use and teat end coverage, although good teat end coverage can be achieved with around 14 ml of teat disinfectant, with amounts below this threshold leading to increasing numbers of teat ends not having any disinfectant coverage. There is also no statistical link between the amount of teat disinfectant used and teat barrel coverage (R^2 = 0.29), indicating the efficiency of the operator is more far more important (Figure 2).

CONCLUSION

There is a significant range in the skill with which post milking teat disinfectants are applied with a hand held, vacuum operated teat sprayer. This level of variation is worrying, and on many farms the objectives of teat spraying are not being achieved. An automatic system that applies the product consistently and achieves acceptable levels of teat barrel and teat end coverage would be advantageous to the industry.

The Evaluation Method is a simple and effective means of accurately measuring the level of teat barrel and teat end coverage with pre-milking and post milking teat disinfectant, whether by manual dipping or spraying or by an automatic system.