

## EFFECTIVENESS OF TEAT COVERAGE WITH POST MILKING TEAT DISINFECTANT APPLIED WITH A DIP CUP

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### INTRODUCTION

The need for post-milking teat disinfection forms one essential element of all mastitis control programmes introduced around the world. The aim is to ensure complete coverage of the teat barrel and teat end with a suitable post-milking teat disinfectant. Good coverage will help ensure good bacterial kill of the teat surface but also (with a good emollient product) lead to teat skin that is soft and supple and which is able to withstand the rigours of milking. Since the introduction of teat disinfection in the UK in the 1960s, teat spraying has proved more popular than teat dipping. A study reported in 2013 (BMC 2013) that hand held vacuum operated teat sprayers achieved teat barrel coverage ranging from 19.8% to 83.4% between farms, with an average of just 50.3%. Only 94% of teat ends were covered with disinfectant.

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

### EVALUATION METHOD

Teat barrel and teat end coverage were assessed post application of the teat disinfectant product on ten farms.

| Farm | Parlour type | Parlour configuration | Number of cows in milk |
|------|--------------|-----------------------|------------------------|
| 1    | Herringbone  | 18:36                 | 95                     |
| 2    | Rotary       | 60                    | 410                    |
| 3    | Herringbone  | 15:30                 | 145                    |
| 4    | Herringbone  | 7:14                  | 78                     |
| 5    | Herringbone  | 8:16                  | 117                    |
| 6    | Herringbone  | 20:20                 | 600                    |
| 7    | Herringbone  | 14:28                 | 260                    |
| 8    | Herringbone  | 8:16                  | 166                    |
| 9    | Herringbone  | 12:24                 | 190                    |
| 10   | Herringbone  | 8:16                  | 180                    |

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 | Average % for Left teats | Average % for Right teats | Average % for Rear teats | Average % for Front teats | Average % for All teats |
|----------------------|------------------------------------|---------------------------------|----------------------------|--------------------------|---------------------------|--------------------------|---------------------------|-------------------------|
| 1                    | 3.97                               | 0                               | 3                          | 98.45                    | 97.42                     | 98.45                    | 97.42                     | 97.94                   |
| 2                    | 3.96                               | 0                               | 4                          | 95.64                    | 95.54                     | 95.74                    | 95.15                     | 95.54                   |
| 3                    | 3.98                               | 0                               | 3                          | 97.40                    | 95.17                     | 96.35                    | 96.42                     | 96.35                   |
| 4                    | 3.96                               | 0                               | 3                          | 97.43                    | 96.14                     | 95.71                    | 97.86                     | 96.71                   |
| 5                    | 3.98                               | 0                               | 2                          | 97.89                    | 97.76                     | 97.85                    | 97.81                     | 97.83                   |
| 6                    | 3.98                               | 0                               | 3                          | 88.30                    | 90.26                     | 90.63                    | 87.93                     | 89.21                   |
| 7                    | 3.92                               | 6                               | 3                          | 90.13                    | 95.13                     | 90.85                    | 94.40                     | 92.20                   |
| 8                    | 3.95                               | 1                               | 5                          | 95.00                    | 95.00                     | 96.67                    | 96.67                     | 96.49                   |
| 9                    | 3.92                               | 7                               | 3                          | 93.07                    | 94.02                     | 91.55                    | 95.53                     | 93.54                   |
| 10                   | 3.98                               | 0                               | 2                          | 97.36                    | 96.50                     | 96.86                    | 97.00                     | 96.93                   |
| <b>STUDY AVERAGE</b> | <b>3.96</b>                        | <b>1.4</b>                      | <b>3.1</b>                 | <b>95.07</b>             | <b>95.29</b>              | <b>95.07</b>             | <b>95.62</b>              | <b>95.28</b>            |
| Minimum              | 3.92                               | 0.00                            | 2.00                       | 88.30                    | 90.26                     | 90.63                    | 87.93                     | 89.21                   |
| Maximum              | 3.98                               | 7.00                            | 5.00                       | 98.45                    | 97.76                     | 98.45                    | 97.86                     | 97.94                   |

**Table 2. Percentage teat end coverage**

|                              | Rear Left | Front Left | Front Right | Rear Right | Average     |
|------------------------------|-----------|------------|-------------|------------|-------------|
| <b>Teat end only covered</b> | 99.5      | 99.6       | 99.9        | 99.8       | <b>99.7</b> |
| <b>No teat end coverage</b>  | 0.5       | 0.4        | 0.1         | 0.2        | <b>0.3</b>  |
| <b>No teat *</b>             | 0.8       | 0.6        | 0.8         | 0.9        | <b>0.8</b>  |

\* three quartered cow and/or unit not applied

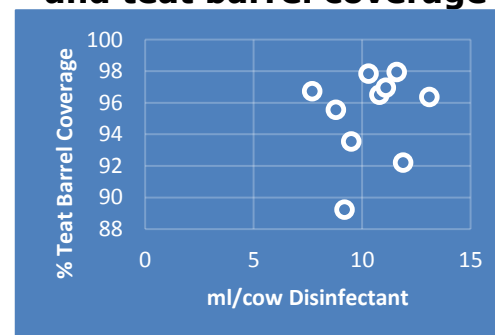
**Table 3. Teat barrel coverage**

|  | Rear Left |       | Front Left |       | Front Right |       | Rear Right |       |
|--|-----------|-------|------------|-------|-------------|-------|------------|-------|
|  | Back      | Front | Back       | Front | Back        | Front | Back       | Front |
| <b>Average teat coverage (score out of 50)</b> | 46.9      | 46.5  | 48.5       | 48.1  | 47.6        | 46.9  | 48.4       | 48.2  |
| <b>No barrel coverage (number)</b>             | 0.4       | 0.4   | 0.5        | 0.5   | 0.1         | 0.1   | 0.3        | 0.3   |
| <b>Average number of cows scored</b>           | 112       |       | 112        |       | 112         |       | 112        |       |

In contrast to the study of manual teat spraying (BMC 2013) where there were significant differences in barrel coverage between the front and rear planes of each teat, teat dipping resulted in excellent overall coverage with only a very minor number of teat ends missed. An automatic teat disinfection spray system (Locate'n'Spray™) was evaluated to show a superior consistency of teat barrel coverage to manual spraying (BMC 2014), but this study of teat dipping provides better overall coverage.

On average 10.3 ml disinfectant was used per cow, with a range from 7.7 to 13.1ml. As shown in figure 1 there is no relationship between the amount of disinfectant used per cow, and teat barrel coverage.

**Figure 1: Disinfectant use and teat barrel coverage**



### CONCLUSION

The application of teat disinfectant using a manual dip cup is far superior in effectiveness than by hand operated teat sprayer. There is a much higher level of consistency of application and, to all intent and purposes, achieving the target of complete teat barrel coverage. Dipping also makes a saving of around 33% in teat disinfectant use compared to manual spraying. Although the "Gold Standard", manual dipping is time consuming and an automatic system that can apply the product consistently with acceptable levels of teat barrel and teat end coverage is likely to be advantageous to dairy farms.

### REFERENCES:

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