

CASE STUDY: USE OF VACCINATION TO CONTROL BOVINE MASTITIS CAUSED BY *KLEBSIELLA*

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OBJECTIVES

Mastitis is an important animal disease causing decreased production and profits on dairy farms. J5 vaccines against gram negative pathogens have been used in the US for over 40 years. Since 2009 a polyvalent vaccine protecting against coliforms, *Staphylococcus aureus* and coagulase negative staphylococci (CNS) has been available in Europe (STARTVAC[®]). The objective of this field trial is to find out on a farm with known *Klebsiella* mastitis problems if vaccinated cows become chronic after a clinical or subclinical infection with *Klebsiella*.

MATERIALS AND METHODS

In a herd with 110 cows in milk, located in Flevoland in The Netherlands, during 2011 a problem with *Klebsiella* was diagnosed. Cows are housed in freestalls with dried manure solids as bedding material. Cows are milked in 2 robots (Lely A4) 3-3,2 times a day. After milking, a lactic acid product is applied as a spray. All cows have been vaccinated since December 2014 including the heifers starting from four months before calving. Vaccinated animals received the first two doses in a four weeks interval. After this, a blanket vaccination protocol was done (single dose applied every three months for all cows and heifers). Animals with identified clinical mastitis were sampled in a sterile way before treatment, then a PCR test of the milk sample was performed. Every 3-4 months all cows with an elevated somatic cell count in two consecutive tests (cows >250.000 and heifers >150.000) were sampled from all quarters. Later samples were pooled on cow level and a PCR was performed. Cows with a positive *Klebsiella* result on both a clinical or subclinical mastitis are followed in time in order to check the presence of *Klebsiella*. Clinical mastitis cases are being treated with a combination of cefalexine and kanamycine and injected with a combination of trimethoprim and sulfadoxine. Subclinical mastitis cases are not treated.

RESULTS

In 2014 there have been 31 cases of clinical mastitis. 15 cases were severe. Milk samples have been taken from 11 of these severe cases. Results were; 1 *E. coli* and 7 *Klebsiella* cases. Of these 7 *Klebsiella* cases 5 cows have either died or have been euthanized. In 2015 there have been 17 cases of clinical mastitis (Fig.1) After sampling all of them, in 4 cases *Klebsiella* was found. From the subclinical mastitis cases (2015), in 4 cows *Klebsiella* has been found. Non of these *Klebsiella* cows have died or have been euthanized. Considering these clinical or subclinical mastitis, during resampling, 6 out of the 8 cows (75%), that had been positive for *Klebsiella* didn't show any *Klebsiella* anymore. In 2 cases (25%) *Klebsiella* was found in one or more samples during the resampling (Fig. 2).

The "Defined Daily Dose Animal" (DDDA) for mastitis injectors from 1-1-2014 to 1-10-2014 was 1,07 and from 1-1-2015 to 1-10-2015 it is 0,66. The (total) DDDA for this farm from 1-1-2014 to 15-11-2014 was 4,45 and from 1-1-2015 to 15-11-2015 it is 3,29 (Fig. 3).

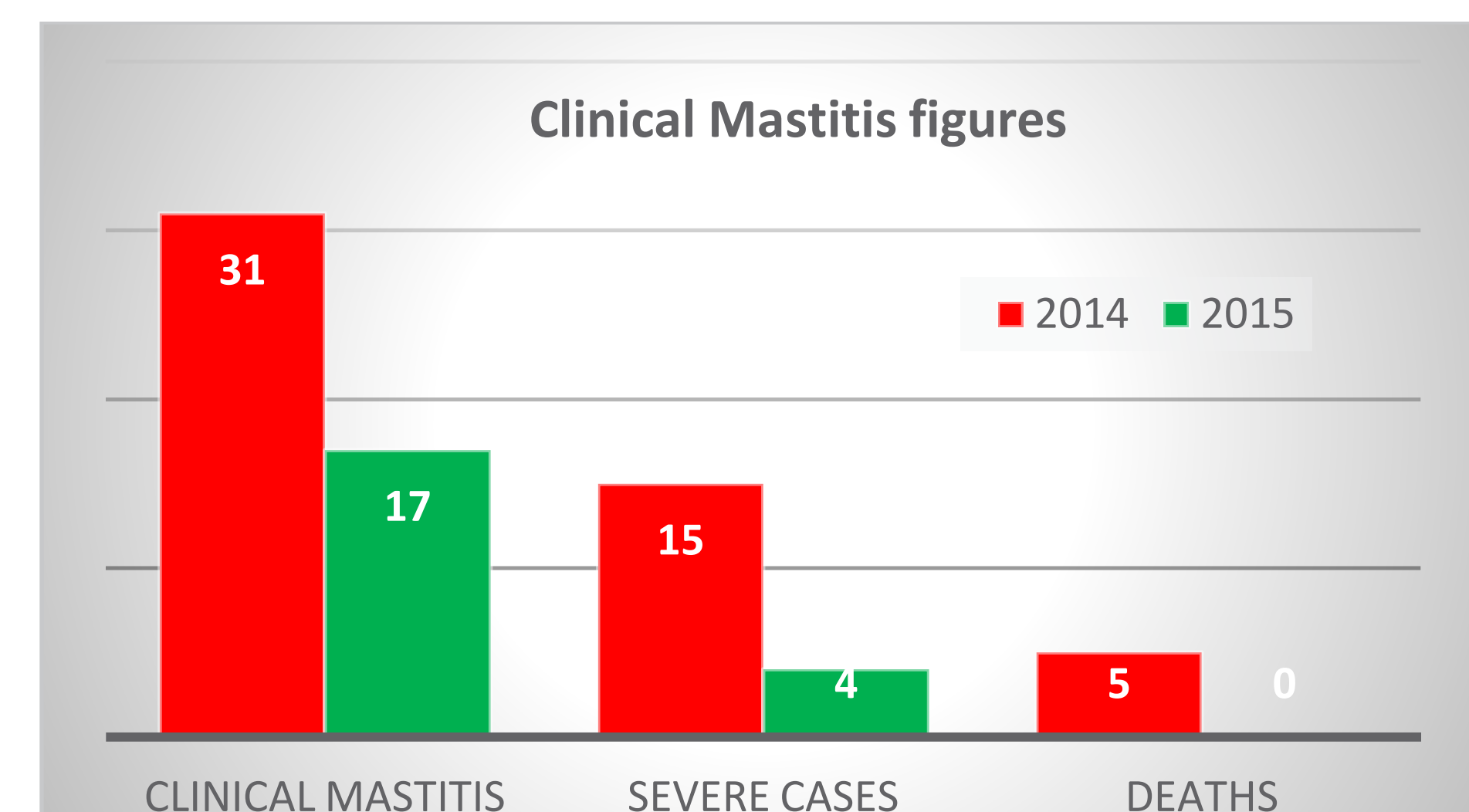


Figure 1. Clinical cases, sever mastitis and deaths in 2014/ 2015.

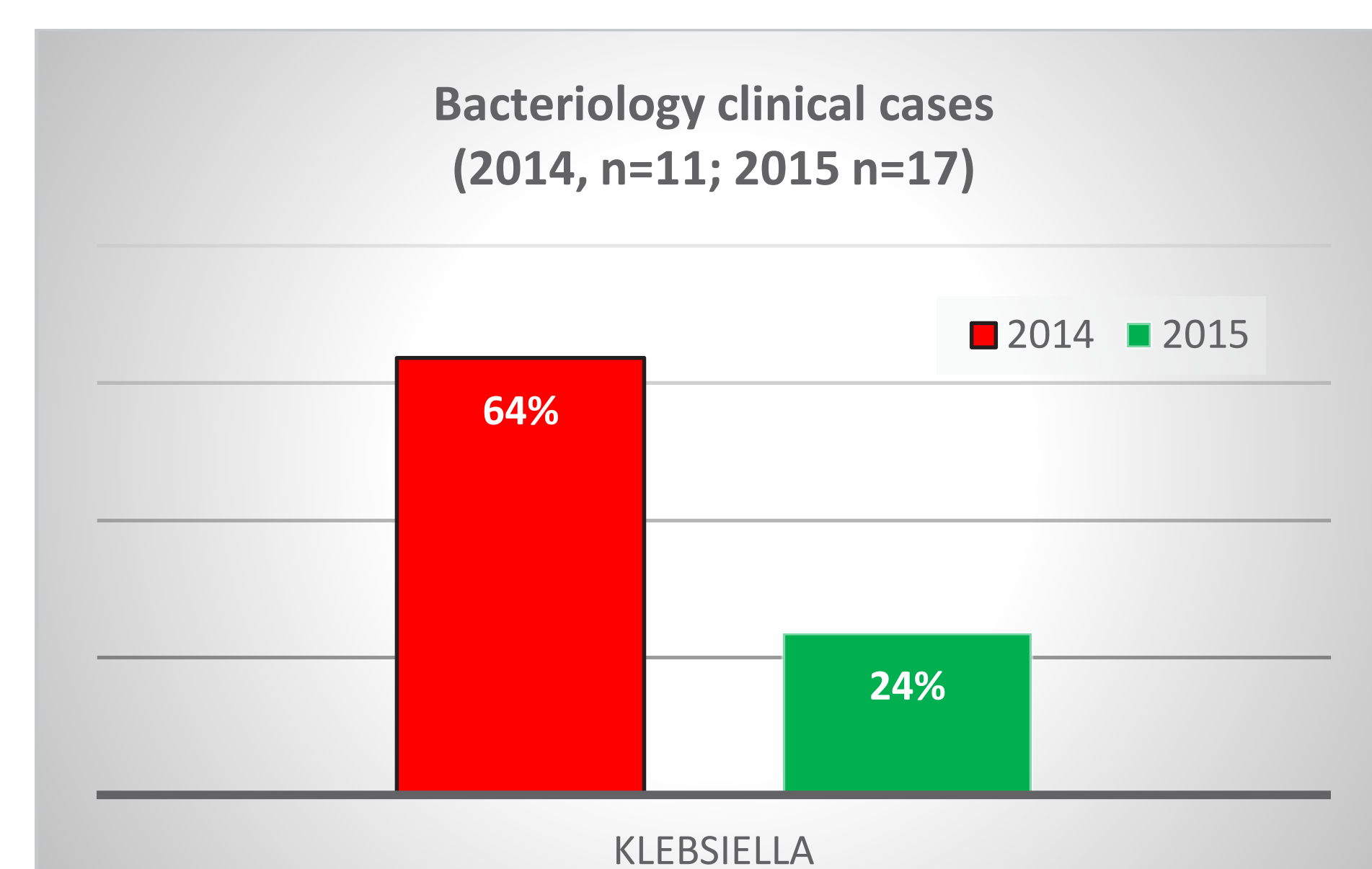


Figure 2. Bacteriology results.

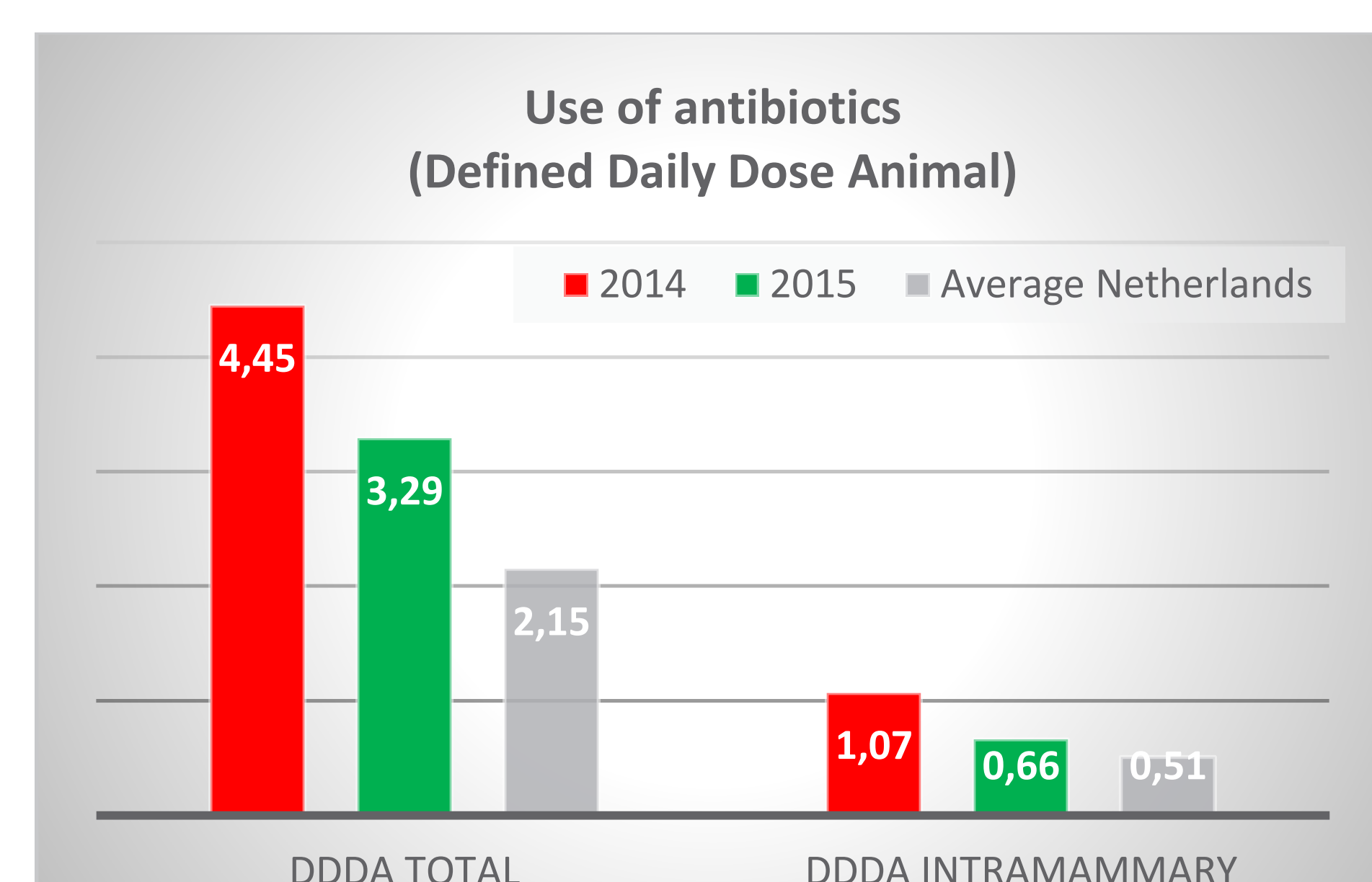


Figure 3. "Defined Daily Dose Animal" (DDDA).

CONCLUSIONS

Conclusions: On a farm with known *Klebsiella* mastitis problems vaccination can help controlling disease by preventing quarters to become chronically infected. In addition cows suffer less severe clinical mastitis and cure rates have improved after vaccination. However it is advised to track all confirmed *Klebsiella* mastitis cases. It is also important to sample high somatic cells cows on regular basis in order to quickly identify possible *Klebsiella* carriers.