

mately forty feet of barn on one side of it and eighty feet on the other. When the pipeline was installed on this farm two loops were created to serve the portions of the barn to either side of the milkhouse.

I started out investigating the problem in this herd just as in the first one, with C.M.T.s, cultures, and an evaluation of equipment and milking techniques. I could find no problems at all in this herd. I told the dairyman that I did not believe the high bacteria count was coming from the udders, and that he should investigate his sanitation and cooling more thoroughly.

Since the problem had begun shortly after the pipeline was installed, it made sense to concentrate on the pipeline in looking for the problem. The dairyman proceeded to take it down, length by length. He found the problem, on the far side of the barn, at the "Y" fitting where the two loops joined. The pipeline on the longer side of the loop was caked with spoiled milk, with just a narrow streak at the bottom which was clean.

Obviously this pipeline was not being properly washed, and the source of the problem was traced to the way the line was installed in the new barn. In the old barn, all four units were used to draw wash water into the single loop. This water was circulated to wash the line.

In the new barn, with the two loops, two units were used to wash each loop. On the longer loop, two units simply did not allow enough water to be drawn into the system to get an adequate "slug" of water to properly wash the 2" diameter line. By the time the "slug" reached the end of the longer loop, it had died to just a trickle.

The problem was resolved in this barn by adding an extra inlet to the long loop, and running a hose directly to the wash tank from this inlet to allow more wash water to be drawn up into the line.

**Since I was drawn into working with these two clients on high bacteria counts, I have taken the Quality Milk Seminar associated with the annual A.A.B.P. Convention. I am more comfortable dealing with such problems now as a result of attending that seminar.**

I believe these two cases are important to share because they illustrate that even when practitioners try to stay out of "non-cow" areas of milk quality, we are sometimes forced to get involved. When a milk inspector tells the dairyman that "the problem is in the cows, call your veterinarian", we are forced to do something. It behooves us to understand the factors that can play a role with high bulk tank bacteria counts.

## Abstracts

### Effects of luteinising hormone on embryo production in superovulated cows

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*Veterinary Record* (1986) **119**, 625-626

Equivalent doses of follicle stimulating hormone (FSH) produced the same number of embryos and ova from a single flush irrespective of the luteinising hormone (LH) content of the superovulating drug ( $P < 0.108$ ). As the LH content of the FSH increased, the proportion of transferable embryos decreased ( $P < 0.001$ ) because the proportion fertilised decreased ( $P < 0.001$ ) and the degeneration rate of the fertilised embryos increased ( $P < 0.002$ ). FSH-W free from detectable luteinising hormone produced 8.8 embryos per flush of which 5.7 were transferable, representing 7.6 fertilised embryos of which 21 per cent had degenerated. The addition of a very small quantity of LH (FSH/LH ratio more than 500) resulted in 5.8 transferable embryos from a total of 10.6, of which 9.0 had been fertilised and 34 per cent of those fertilised had degenerated. Commercial FSH-P (FSH/LH less than 100) produced 3.3 transferable embryos from a total of 8.1, of which six had been fertilised and 39 per cent of those fertilised had degenerated. The luteinising hormone content of FSH-P has to be controlled and limited for optimum superovulation in cattle.

### Copper deficiency in ruminants; recent developments

N. F. Suttle

*Veterinary Record* (1986) **119**, 519-522

The aetiology of copper deficiency in grazing ruminants has been clarified by a number of recent discoveries: the low availability of copper in lush grazed pasture compared with conserved forage; the inhibitory effects on absorption of small increases in herbage molybdenum and sulphur and the antagonism from iron ingested in soil; and the wide genetic variation in copper absorption between different breeds of sheep. The economic importance of copper deficiency has been emphasised by the discovery of unsuspected causes of loss: increased susceptibility to infection and growth retardation in lambs and infertility in cattle. The diagnosis of functional copper deficiency has been improved by the addition of erythrocyte superoxide dismutase to the assays of copper status.