Optimising the Choice of Cows in the Organisation of the Milking Process

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Objectives
As reported in the literature, in double herring bone parlours can be prolonged waiting times for cows with shorter extraction times. In South East of Sicily that kind of parlour is the most spread. Previous trials showed that to reduce milking times it is necessary to focus on the milk extraction time. The same trials showed that to reduce waiting times the milk extraction rate is the parameter by which the animals should be grouped and milked together. The aim of the actual research is to confirm the time reduction obtained with grouping heads in function of milk extraction rate and to determine how many surveys must be conducted to obtain a sufficiently close approximation to the extraction rate of each animal, because only if the surveys are a small number the found way will be really useful. We chose a representative farm of the SE of Sicily in an area very much involved in animal farming. The farm is equipped with a "double herring bone (3+3)" plant, situated in a parlour which the cattle enter without any pre-established order. We study the productive performance of each animal, including the quantity of milk produced at each milking and measured the milk extraction rate. The milking operations were broken down into constituent stages, which were timed. A milking simulation was carried out by grouping cows in function of the same or similar milk extraction rate. Thank to the milking simulation with groups made up of heads with similar rates we con confirm a great reduction in time loss and a dramatic increase in the work capacity of the parlour (head/h). We set up the correct procedure that consists in screening out cows that are sick or close to lactation period and through the research we are able to confirm that with a small number of surveys we can measure the correct milk extraction rate of every heads. We have establish how much time could be saved by forming homogeneous groups.

Keywords: herring-bone parlours, herd, work organisation

Introduction

Herring bone, simple or more frequently double, is a very spread kind of milk parlour and in particular in the south east of Sicily.

Animals enter into the parlour and leave in groups and group milking time is affected from herd very slower than the others: in fact, animals that have already been milked remain in the parlour longer than necessary because of the presence of slower cows.

Herd milking time depends greatly from milk time extraction (71%), while the remaining phases take much less time. Milk extraction time is strictly connected with milk extraction rate and this parameter was found to be constant, reliable and

independent of the quantity if milk produced. Usually the milking job is carried out from a specialised operator, thus the routine cannot be further compressed. Therefore, the way to reduce group milking time is to grouping the animals with the same or similar milk extraction rate. Our study regards a small milk parlour and intends to verify if grouping heads results in saving time.

Materials and methods

The research was carried out into a double herring bone parlour (2 + 2) selected as representative in the south east of Sicily. Each survey concerned 36 heads, grouped in 9 groups. Heads formed groups without the intervention of any operator.

The steps involved in the research are:

1 – studying the herd with the aim to eliminate from the observations heads not in health or close to lactation;

2 - using milking extraction rate as parameter for grouping the cows;

3 – carrying out a number of observation concerning the operations in the parlour (work organisation) and the performance of each head (quantity of milk produced at each milking and the milk extraction rate;

4 - determining the lowest number of observation to carry out in the parlour to identify the cows with similar milking extraction rate

5 – proceeding with "simulated milking", forming homogeneous groups in function of similar values of milk extraction rate;

6 – calculating the better performance (head/h) of the simulated milking than real milking (15 milking)

Results

Data statistic elaboration shows that five were the lower number of survey occurring to determine the mean value of milking extraction rate of each head. Taking in account the results of that five surveys we have calculate the simulated cycle times and after the time saving.

The mean milking time of the heard (including the whole routine, from the entrance of the first head of each group in the parlour until the exit of the last) was 78'2". On average, it means about 2'/head and the work capacity of the parlour was found to be approximately around 30 heads/h. Forming simulated groups show a mean time saving of about 13' (17%).

Milking	Observed (min)	Simulated (min)	Time saving (mn)
1	77.1	63.5	13.6
2	82.3	66.6	15.8
3	88.9	68.3	20.5
4	78.8	59.8	19.0
5	80.1	60.1	20.0
6	81.2	61.7	19.6
7	69.9	62.5	7.4
8	79.2	67.8	11.4
9	71.4	61.5	9.8
10	77.1	70.1	7.0
11	79.5	69.6	9.9
12	70.8	62.2	8.6
13	81.5	68.5	13.0
14	77.0	66.5	10.5
15	77.6	66.6	11.0
Means value	78.2	65.0	13.1

Conclusion and prospects

Grouping cows in function of similar values of milking extraction rate results in milking time saving. The research confirms that with a low number of surveys the correct milking extraction values of each head can be assessed. An algorithm could be set up with the aim to facilitate farmer to assess the correct milking extraction values of each head within the lowest number of surveys; with a spreadsheet it can be easily to calculate the time saved milking grouping heads in terms of similar milking extraction rate. As grouping the whole herd can result expensive in terms of time or demanding for the milker (that often works alone), good results can be obtained grouping only slowest cows with the aim to milk them separately from the fastest.

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