

# Robotic Milking Systems

## What actually dictates litres per robot per day?

There is much talk in the industry about which robot is the quickest and which one has the potential to yield the most litres per day. There are 5 to choose from in The UK and so should this be a factor when it comes to making your decision on which one to buy? In my experience no, but let me explain my reason for this statement.

For the purposes of this article, I am only going to be basing my figures on single box systems, which all of the manufacturers produce, on a housed, free access system.

Apart from the speed with which the robots attach, there are two other crucial factors that influence output per box per day, which are average yield and milk speed. So, we have to start by looking at the time that is actually available for milking in 24 hours.

We need to take wash time out, which is approximately an hour per day when washing 3 times in 24 hours. Recommended free time on a free access system is 10% in 24 hours, ie. When the robot is not milking, as this allows shy cows and heifers to pick their opportunity to get milked, so this needs to be deducted. I have then assumed that we have a buffer tank in place and so there is no time deduction for emptying the bulk tank, but I have added an additional 5% down time per day, to allow for any unforeseen issues.

As you can see from my calculations below, we now have just under nineteen and a half hours per day for milking.

	Minutes	Hours
Minutes available in 24 hours	1440	24
Minus wash time	60	1
Minus 10% free time	144	2.4
Minus 5% Av down time	72	1.2
Remaining time	1164	19.4

We now want to maximise the time that we have for milking and the best way to do this is with high yielding, fast milking cows, as they will produce more milk per visit in the quickest time. Low yielding, slow milkers will take exactly the same amount of time to enter and exit the robot, undergo teat preparation and attachment as the high performing cows. So, they have a considerable negative impact on total output per robot per day. Much more so than the actual speed of attachment.

Let me back this up with some figures:

Average litres/cow/day	Average milkings/cow/day	Average milk speed	Entry, prep attach and exit *	Total box time*	Total milkings/day	Cows in milk	Total litres/day
30	3	2.2	2	6.5	178	59	1778
35	3	2.4	2	6.9	170	57	1978
40	3	2.6	2	7.1	163	54	2178

\*Minutes

By keeping the entry, preparation, attachment, and exit time, constant we can see the effect of yield and milk speed. We actually gain a total 400 litres here, between the lowest and highest performing example with less cows in milk.

I would consider the 40 litre average, per cow to be a high performing robot and of course the challenge is to achieve this 365 days of the year. To get beyond this, the herd will need an even higher yield or better milk speed and everything working in their favour.

If we take the same the same figures as above and decrease our attachment time by 10 seconds you can see that the impact is only around 60 litres per box per day. So, this has far less influence on milk produced per box per day then yield and milk speed.

Average litres/cow/day	Average milkings per cow /day	Average milk speed	Entry, prep and exit *	box time*	Total milkings/day	Cows in milk	litres/day
30	3	2.2	2.0	6.5	178	59	1778
30	3	2.2	1.8	6.3	183	61	1834
40	3	2.6	2.0	7.1	163	54	2178
40	3	2.6	1.8	6.9	168	56	2240

Unfortunately, very few conventional parlours measure milk speed and so it can be quite revealing when a farmer starts his robots up for the first time, to see the herd's performance. I have seen milk speeds as low as 1.9 litres per minute, which needless to say was a shock for us all and had a major impact the robot's output. Milk speed is purely down to genetics and so improving it can take years of breeding to have an impact of the whole herd.

### Summary

Average milk yield and milk speed have a major influence on the total litres of milk you can produce per robot per day. Check your herd's milk speed, if possible before making the change to robotics, as this combined with your average yield, will dictate litres produced per day.

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