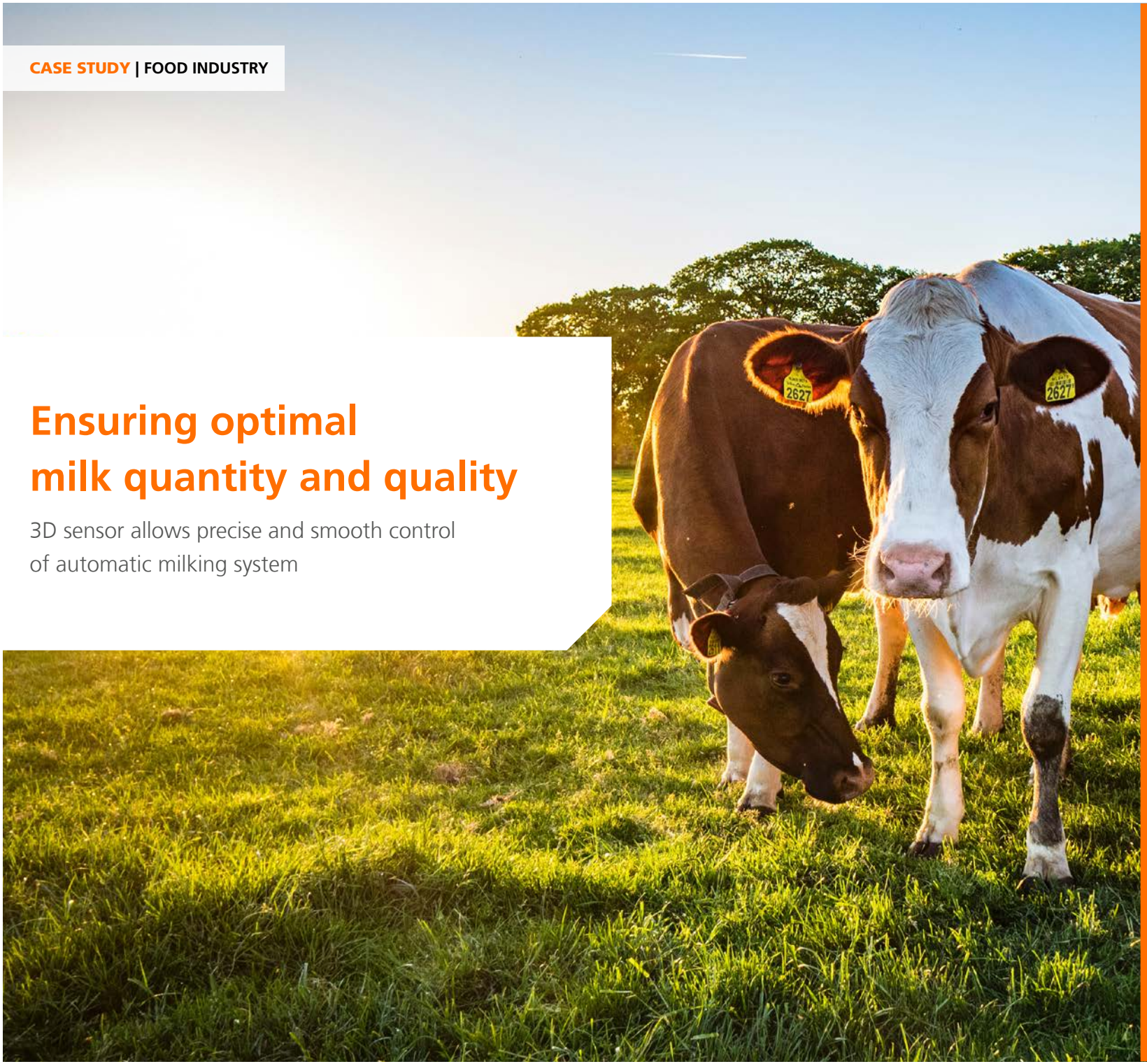
CASE STUDY | FOOD INDUSTRY

Ensuring optimal milk quantity and quality

3D sensor allows precise and smooth control of automatic milking system



Our customer:

An international OEM and plant constructor for the food industry who also produces automatic milking systems. They allow cows to be milked without human interference.

This system is being used on many farms worldwide. Traditional businesses that have been in existence for over 100 years are also among the customers.

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The challenge:

The times when farmers would sit on a stool to milk the cows are definitely over. The milk quantity and quality are not only influenced by stress-free milking, but also by timing. If the milking process is not completed promptly, contamination can occur due to inflammation. Therefore, modern dairy farms are highly automatised and nothing is left to chance.
However, apart from productivity, the well-being of the animals is of major importance. Automatic milking systems that serve the herd have to ensure both. What is more, their application in dark, humid and hot or cold places is an additional challenge.

The solution – why ifm?

A sophisticated milking system using modern 3D sensor technology from ifm ensures an animal-friendly milking process. We all know that only happy cows provide the best milk. Observers will not fail to notice that the cows in the barn voluntarily go to the milking station.

A radio chip will identify the cow, and the arm of the milking robot will move from the side under the cow toward the udder. The most important element of this milking arm is the „electronic eye", ifm's 3D camera. It is mounted to the milking arm and detects the „scene" under the cow in the fraction of a second, i.e. the exact position of the teats. The four milking cups can be positioned accurately, one after the other, from below onto the four teats.

The more precise and gentler this process is, the less stressful it is for the cow. And this has a direct effect on the quantity and the quality of the milk. Before the milking cups are applied, the teats will be cleaned with a disinfecting spray. Here as well, the 3D camera of the controller provides an accurate 3D image with all spatial information to ensure that the cleaning nozzles will approach the teats with precision.

The compact 3D camera detects scenes and objects at a glance in their spatial dimensions and provides them as a 3D image. The operating principle, the time-of-flight measurement (ToF), can be compared to that of a laser scanner. However, instead of only one receiving element, the PMD camera has 23,232 receiving elements that are positioned like a matrix on the chip. Four high powered LEDs illuminate the entire field of view of the O3D over a range of 0.3m to 5m. What is particularly special about the PMD technology: The measurement will work irrespective of the colour and type of the surface. Even ambient light sources, reflective or wet surfaces or very dark objects are no problem.

Results:

- Increased milk quantity and quality
- More efficient, automatic milking process
- Precise teat detection for a smooth milking process
- Automatic disinfection against impurities in the milk

Optimal milk quality

Efficiency increase

Safe and animal-friendly farm

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