

Brix-TS Sensor

Determination of the total solids (TS) in the calf's milk in the CalfExpert automatic calf feeder and correction of the milk mixture if deviation from the specified target concentration.

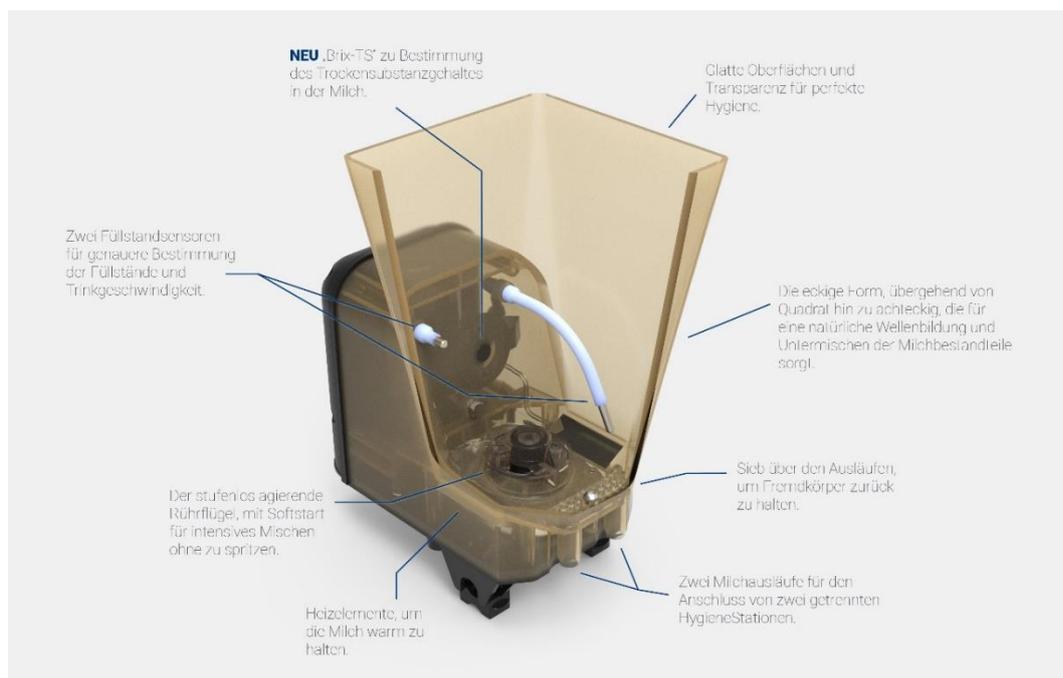
The Innovation

Brix-TS is an electronic Brix-Sensor, integrated into the PowerMix bowl of the CalfExpert calf feeder, which continuously measures the dry matter of the freshly mixed calf milk.

Brix-TS can detect different mixing concentrations of milk replacer. The control of the CalfExpert then corrects the concentration of the milk so that the right milk mixture is always prepared. That is important for example if the necessary calibration has not been carried out after changing the milk replacer. In addition, **Brix-TS** can compensate for reduced powder dosing in case of encrusted powder outlets.

Thanks to **Brix-TS**, the control of the CalfExpert also compensates for fluctuations in the composition of the whole milk by addition of milk powder (see text below).

With **Brix-TS**, the CalfExpert uses the dry matter (total solids) as the definition of the milk composition. In future, there is no risk of confusion in the recommendations for milk concentration. Until now, with a concentration recommendation of e.g. 135 g/l, it was always unclear whether it related to the ready mixed milk itself (= 13.5% TS) or one litre of water (11.9% TS). This error of conversion may mean a deviation of 12% in energy and nutrient supply. Then it becomes difficult to achieve set breeding goals.



The solution for “fluctuating TS levels in whole milk”

Whole milk used in calf rearing shows large variations in nutrient composition. There are several reasons for this:

- In most cases, non-marketable milk is used, which is composed differently. That is e.g.
 - o Colostrum with high protein contents
 - o Milk from cows with udder health issues after pasteurization
 - o Milk from cows with slightly increased cell counts, especially towards the end of lactation, with low total solid levels (ideal even after prior pasteurization)
- Due to water residues from cleaning operations (rinsing of milking utensils, residual water in milk jugs and MilkTaxi hoses), the whole milk for calves is often artificially diluted.
- The composition of the milk also varies, depending on the season and feeding management of the cows.

However, calves are best grown under continuously consistent conditions. The digestive system needs the composition of the milk to be as consistent as possible. Then the enzymes can optimally digest the milk components.

The differences in whole milk composition described above can result, in different growth or even development of diseases in calves, even with a supposedly constant feeding regime.

Moore et.al.¹ described in 2009 the different composition of calf milk from different farms. The TS content of the milk varied from 10.7 to 13.4% with extreme outbreaks of down to 5.1% (probably water in the milk).

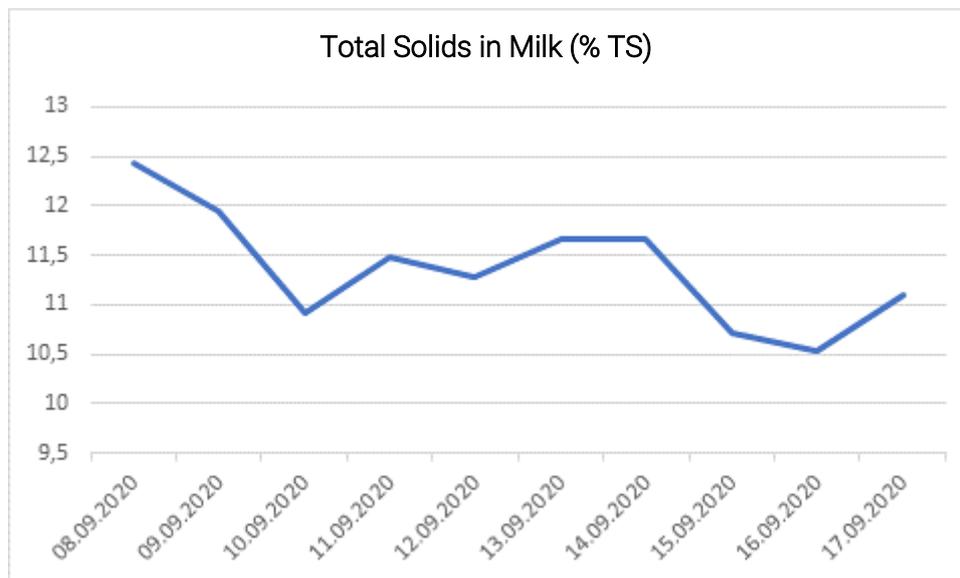
Table 1. Milk quality test results from individual dairies and pooled non-saleable milk at a calf ranch

Sample	TS ¹ (%)	pH	EtOH coagulation	SOC/mL	Blood agar ² (cfu/mL)	MacConkey (cfu/mL)	Salmonella	Mycoplasma
1	12.9	6.0	Positive	2,320,000	TNTC mixed growth	TNTC mixed growth	Negative	Negative
2	12.9	6.3	Positive	3,510,000	TNTC mixed growth	TNTC mixed growth	Negative	Negative
3	12.9	6.1	Positive	3,744,000	TNTC mixed growth	TNTC mixed growth	Negative	Negative
4	11.2	5.6	Negative	9,999,999	TNTC mixed growth	TNTC mixed growth	Negative	Negative
5	11.8	6.6	Negative	3,042,000	TNTC mixed growth	TNTC mixed growth	Negative	Negative
6	10.7	5.5	Positive	9,999,999	TNTC mixed growth	TNTC mixed growth	Negative	Negative
7	12.5	6.4	Negative	1,120,000	Strep 6,000; coliform 10,000	10,000 lactose+; 100 lactose-	Negative	Negative
8	5.1	5.5	Negative	2,800,000	TNTC mixed growth	TNTC mixed growth	Negative	Negative
9	10.1	6.4	Negative	3,540,000	Strep 10,000; coliform 30,000	30,000 lactose+	Negative	Negative
10	6.7	4.7	Positive	1,584,000	TNTC mixed growth	TNTC mixed growth	Negative	Negative
11	13.4	6.4	Positive	1,890,000	TNTC mixed growth	TNTC mixed growth	Negative	Negative
12	12.9	6.3	Positive	1,584,000	TNTC mixed growth	TNTC mixed growth	Negative	Negative
Pooled prepasteurized	11.2	6.2	Positive	Not done	TNTC mixed growth	TNTC mixed growth	Negative	Negative
Pooled pasteurized	11.2	6.3	Negative	Not done	100 coliforms	100 coliforms	Negative	Negative

¹Total solids percentage determined on Brix refractometer reading corrected using regression equation (% TS = 0.0014 × Brix + 1.3312).

²TNTC = too numerous to count; indicates the organisms have grown confluent over the entire surface of the culture plate; Strep = streptococci.

But even on the same dairy farm there are sometimes considerable differences in the TS of milk from feeding to feeding due to the causes described above, as the following curve shows:



Daily fluctuating TS contents in whole milk for calves of a practice farm

For further questions please contact

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