

## MILK SECURITY

### Milk test strips for neutralizers, hydrogen peroxide and urea

Most of milk samples were found to be adulterated. The urea, hydrogen peroxide and neutralizers in milk samples influence on the quality of milk and milk products. Milk security test strips are rapid and sensitive dry strips to detect milk adulteration.

**Test for neutralizers:** Neutralizers like sodium bicarbonate, sodium hydroxide, sodium carbonate or hydrated lime are often added to milk. Usually they are added to milk to increase the lactometer reading. The neutralizers have influence on the values of titratable acidity and pH of milk that is why they must be checked in milk sample. The impregnate test zone with chromogens change color from orange to orange red in the presence of sodium carbonate/sodium bicarbonate/sodium hydroxide. If the color of neutralizers test changes from orange to orange-red, this means that the milk was adulterated with sodium carbonate/sodium bicarbonate/sodium hydroxide ( $> 0.2\% \text{NaHCO}_3$  ;  $> 0.1\% \text{Na}_2\text{CO}_3$  and  $> 0.1\% \text{NaOH}$ ) and the result is positive (+), (abnormal value). This test will be effective only if the neutralizers are present in milk. If the added neutralizers are nullified by the developed acidity, then this test will be negative (-). In that case, the alkaline condition of the milk for the presence of soda ash has to be estimated by another method. The neutralizers content in milk should be estimated by comparison with color scale at 60s.

**Test for hydrogen peroxide:** This test allows a quick and easy method to determine hydrogen peroxide in solution. The impregnate test zone with enzyme and chromogen ensured very selectivity determination of hydrogen peroxide. Hydrogen peroxide ( $\text{H}_2\text{O}_2$ ) is a well known powerful oxidizer. Its capabilities as a disinfectant are superior than chlorine ( $\text{Cl}_2$ ) and chlorine dioxide ( $\text{ClO}_2$ ). Hydrogen peroxide is commonly used in dairy industries. Peroxide indicator strips can be used to ensure that any residual peroxide sanitiser has been fully removed before filling. This acts as a guarantee that the area is safe and free from peroxide. The colors change from yellow (-) - normal values to blue (+).- abnormal values.

The hydrogen oxide content should be estimated by comparison of test zone with color scale at 60s.

**Test for urea concentration:** Urea is generally added in the preparation of milk to raise the solids-not-fat (SNF) value. It has been proven that urea added to milk at a higher concentration reduces the activity of hydrogen ions and increases the pH of the milk. Normal values of urea in milk are from 0 to 70

mg/dl. Urea concentration above 70 mg/dl means that the milk was adulterated with urea. The color scale is 0; 70;  $\geq 120$  mg/dl urea. The impregnate test zone with enzyme and chromogen ensured very selective reaction and change color from yellow to pinkish red. The colors change from yellow (0) to pinkish red (70 and 120 mg/dl urea). The urea concentration above 70 mg/dl (in pinkish red color in the scale) is not desired. In the absence of neutralizers (-), urea must be estimated by the scale 1, at 80-90s. In the presence of neutralizers (+) color intensity of the urea scale increases and urea content in milk should be estimated on a scale 2, at 80-90s. Neutralizers change the color indication area for urea. In case a positive result for neutralizers is received, the urea result must be compared with the second color scale (more intensive).

**Recommendations:**

- When removing a test strip from the milk sample it is necessary, to completely remove milk drops from the test paper by tapping the test strips on the edge of the cup. Then put the back side of test strips on filter paper or other paper for full removing of milk drops.
- Do not touch the indication area.
- When using the test take out only the necessary number of strips. Then the tube must be tightly closed (hear a click).

**Storage:** Express test strips should be stored in tightly closed tube in a dry and dark place, never in the refrigerator.

**Expiration date:** 6 months from date of production.

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