

# SENSIStrip Milk Protein 20 Tests

## Lateral-flow Device for the Determination of Milk Protein in Food and as Cleaning Control Monitoring (Cat.nr. HU0030123)

Sensitivity for food matrix	1 ppm
Sensitivity for swabbing	0.003 µg/cm <sup>2</sup>
Sensitivity for rinse water	0.07 mg/L

### 1. GENERAL INFORMATION

Bovine milk belongs to the most important allergenic food ingredients especially for children. Already very low amounts of bovine milk can cause allergic reactions, which may lead to anaphylactic shock in severe cases. Because of this, milk allergic persons must strictly avoid the consumption of milk or milk containing food. In particular the presence of hidden milk proteins such as in sausage, cookies, convenience food or beverages represent a critical problem for milk allergic persons. According to EU Directive 2003/89/EG the addition of bovine milk has to be labeled. For the detection of bovine milk in foodstuffs, sensitive detection systems are required.

Approximately 80% of bovine milk proteins are caseins.  $\beta$ -lactoglobulin, the major allergen of whey, represents further 10% of the total protein

The **Eurofins Technologies Milk Protein Lateral Flow Device** represents a sensitive detection system and is particularly capable to detect milk protein residues (casein &  $\beta$ -lactoglobulin) in food matrices, rinse water and swabs.

### 2. PRINCIPLE OF THE TEST

The **Eurofins Technologies Milk Protein** test is based on the principle of immunoassay. Milk Protein containing sample is given into a reactions vial containing biotinylated antibodies directed against casein and  $\beta$ -lactoglobulin. After 3 minutes incubation at room temperature a test strip is placed into the reaction vial. The sample migrates along the nitrocellulose membrane by capillary forces. Along its way it releases gold nanoparticles conjugated to streptavidin. An antibody-gold complex is formed. For positive samples a red line is formed when the liquid reaches the test line area. In case of negative samples, no line is formed. In any case, above the test line area a red control line appears, indicating the validity of the test. The test is evaluated after another 5 minutes.

### 3. PRECAUTIONS

Full compliance of the following good laboratory practices (GLP) will determine the reliability of the results:

- 1) Store the kit at 2-8°C.
- 2) Do not use the kit after its expiry date.
- 3) Prior to beginning the assay procedure, bring all samples and reagents to room temperature (20-25°C).
- 4) Extraction buffer should be mixed by gentle inversion or swirling prior to use. Do not induce foaming.
- 5) Once the assay has been started, all subsequent steps should be completed without interruption and within the recommended time limits.
- 6) Replace caps in all the reagents and samples immediately after use.
- 7) Use separate disposable consumables for each transfer of sample to the reaction vial in order to prevent cross-contamination.
- 8) Do not mix components from different batches.
- 9) Do not use reagents after expiration date.

**NOTE:** The swab sampling device included in this kit may be supplied as sterile with a sterility expiration date printed on the device. However, this kit does not require a sterile sampling device, therefore the swab sterility expiration date does not affect the kit expiration date and can be disregarded.

### 4. CONTENTS OF THE KIT

The kit contains components and reagents for 20 tests. They have to be stored at 2-8°C. Expiry data are printed on the labels of the reagent containers and the outer package.

- 1) Test strips, 20 pcs in tube with desiccant stopper.
- 2) Reaction vials, 20 pcs.
- 3) Extraction tubes with caps, 20 pcs.
- 4) Extraction buffer, 60 mL, ready-to-use.
- 5) Disposable pipettes, 0.3 mL, 20 pcs
- 6) Disposable pipette, 3 mL
- 7) Disposable spatulas, 20 pcs

- 8) Swab sticks, 20 pcs
- 9) Evaluation card
- 10) Tubes and vials racks
- 11) Instruction manual

## 5. SAMPLE PREPARATION

Due to high risk of cross-contamination all applied instruments like applicator, mortar, vials etc. have to be **cleaned thoroughly** before and after each sample. Allergen proteins adhere very strongly to different surfaces. In certain cases, they can resist a common dishwasher cleaning. To identify possible cross-contamination caused by previous extractions it is strongly recommended to note the sequence of the extractions for pattern recognition.

Chocolate and other products with high polyphenol content tend to show reduced results. To overcome this effect a special extraction additive can be ordered separately (ILE-EXSCH2).

### SOLID SAMPLES / LIQUID SAMPLES

- 1) Homogenize sample using appropriate methods depending on its specific nature (e.g. grind, crush, mix).
- 2) *Solid samples:* Transfer one spatula of sample to an extraction tube. Alternatively, in order to increase precision, weigh out 0.2 g of sample into an extraction tube.  
  
*Liquid samples:* Transfer a half spatula of sample liquid to the extraction tube. Alternatively, in order to increase precision, pipette 0.2 mL of sample into an extraction.
- 3) Add 3 mL of ready-to-use extraction buffer to the sample by using the disposable 3 mL pipette.
- 4) Close extraction tube with cap and shake for 1 minute.
- 5) Let the solid remains sediment. Depending on nature of the samples this might take 1-2 minutes. Alternatively centrifuge at 2000 g or higher.
- 6) Remove cap and transfer 0.3 mL of sample supernatant into a reaction vial using a disposable 0.3 mL pipette.

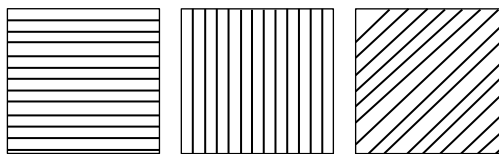
### RINSE WATER

- 1) Adjust the pH of the sample to 7 (+/- 0.5).
- 2) In case of pure water add 1% NaCl.
- 3) Transfer 0.3 mL of sample into a reaction vial using a disposable 0.3 mL pipette.

## SWABBING SAMPLES

### DRY SURFACES

- 1) Mark out 5x5 cm area or use swab directly on (e.g. uneven) area.
- 2) Transfer 1 mL of ready-to-use extraction solution into an extraction tube by using the disposable 3 mL pipette.
- 3) Moisten a swab by dipping into the tube.
- 4) Swab marked area by using crosshatch (1. horizontally, 2. vertically, 3. diagonally) technique while rotating the tip.



- 5) Place swab into the tube and break off the tip.
- 6) Close extraction tube with cap and shake for 1 minute to release the sample from the swab.
- 7) Remove cap and transfer 0.3 mL of sample supernatant into a reaction vial using a disposable 0.3 mL pipette.

### WET SURFACES

Apply same method as described for dry surfaces without prior need to moisten the swab.

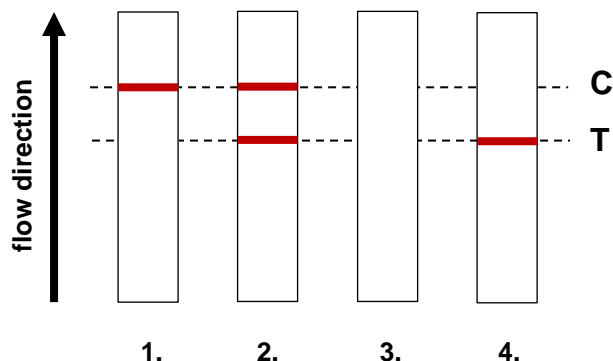
## 6. PROCEDURE

- 1) Prepare samples as described above.
- 2) After transfer of the sample to the incubation vial add cap and shake for 15 seconds. Make sure that the biotinylated antibody is completely dissolved.
- 3) Incubate for 3 minutes.
- 4) Remove cap and place one strip into the vial. For proper strip orientation make sure that the arrows on the cover foil point downwards.
- 5) Incubate for 5 minutes.
- 6) Remove strip from the vial and evaluate immediately.

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## 7. EVALUATION

SENSIStrip lateral-flow devices are evaluated according to the following scheme:



1. **Negative:** visible control (C) line, no test (T) line
2. **Positive:** visible control (C) and test (T) lines
3. **Invalid:** neither control (C) and test (T) lines visible
4. **Invalid:** no control (C) line and visible test (T) line

For a better distinguishing between negative, borderline and positive samples a colour card for evaluation is provided with the kit. The intensity of the test line has to be compared with the different increments of the colour card. Results lower than increment 3 should be treated as negative. Results according increment 3 or higher should be treated as positive. Since the increments of the colour card are ranging up to 10 a semi-quantitative evaluation is also possible. This can be improved by taking into account the results stated in the validation report of the product.

## 8. PERFORMANCE

### Sensitivity

LOD (sum of casein &  $\beta$ -lactoglobulin) of the SENSIStrip lateral-flow test is 1 ppm for food matrix, 0.07 mg/L for rinse water and 0.003  $\mu\text{g}/\text{cm}^2$  for swab samples applying the procedure above.

Note: Sensitivity may vary depending on matrix and processing of a complex food mixture. For achieving reliable results each matrix should be validated prior to routine testing.

### Cross-reactivity

For the following foods not cross-reactivity could be detected:

Adzuki bean	Curcuma	Pea
Almond	Dill	Peach
Apricot	Duck	Peanut
Barley	Egg	Pecan
Bean, white	Ewe's milk	Pepper

Bovine	Fennel	Pine nut
Bovine gelatine	Fenugreek	Pistachio
Brazil nut	Flaxseed	Poppy seed
Buckwheat	Garden cress	Pork
Caraway	Garlic	Potato
Cardamom	Glutadin	Pumpkin seed
Carob bean	Goat's milk	Radish
Carrot	Guar gum	Rice
Cashew	Hazelnut	Rye
Cayenne	Horseradish	Sesame
Celery	Kidney bean	Shrimp
Cherry	Kiwi	Soy flour
Chestnut	Lamb	Soy lecithin
Chia	Leek	Soy milk
Chicken	Lentil	Split peas
Chickpea	Lupin	Sucrose
Chili	Macadamia	Sunflower seed
Cinnamon	Mustard, yellow	Thyme
Clove	Nutmeg	Tomato
Cocoa	Oats	Turkey
Coconut	Onion	Walnut
Cod	Oyster	Wheat
Corn	Paprika	White cabbage
Cumin		

The following cross-reactions were determined:

Goat's milk	2%
Ewe's milk	2%

### High-dose-hook Effect

Reduced or absent signals can occur in case of very high concentrations. The test gives valid results up to a concentration of 250 ppm for food samples, according 0.7  $\mu\text{g}/\text{cm}^2$  for swabs and 16.7 mg/L for rinse water samples.

### Additional Performance Data

Additional data can be found in the corresponding validation report of the product, which can be inquired at Eurofins Technologies.