Disp&FLOW® – Pork
(raw, cooked, or processed pork meat)

Rapid lateral flow test for the detection of specific antigen

Cat. No.: **BIO.027.1**

Number of tests per kit: **1**

Rapid immuno-chromatographic test for the qualitative determination of a glycoprotein of porcine origin in food, or on cooking utensils and preparatory surfaces in the context of food production and relevant processing facilities.

The **Disp&FLOW – Pork – raw, cooked, or processed pork meat** (or **Pork-rcppm**) test has been designed to detect a target antigen in two main types of specimens:

1. Solid food samples / solid food products / kitchen utensils / technical surfaces dedicated to the cutting or processing of foodstuffs.
2. Liquid samples of the following types: soups; sauces; beverages; rinsing water from food preparation tools, rinsing water from kitchen utensils, technical surfaces dedicated to cutting, processing, and storing food products.

Presentation / How it works

The word 'pork' refers to the meat from pigs when 'pig' refers to the animal itself. Pig (*Sus scrofa domesticus*) belongs to the *genus Sus*, and the *Suidae* family (pigs, hogs, and boars), within the *Artiodactyla* order (even-toed ungulates), a subclassification of mammals. The domestic pig (*Sus scrofa domesticus*) is a subspecies of the wild boar (*Sus scrofa*) and has been selectively bred over generations for various purposes, including food production.

The prevalence of food allergies or intolerances purely associated with pork meat is low. The usefulness of the test comes mainly from the fact that pork components can be used to adulterate foods believed to contain finer meats. Furthermore, the consumption and handling of materials of porcine origin are prohibited by certain religious imperatives.

The **Disp&FLOW – Pork-rcppm** test detects a species-specific antigen by involving an ultra-heat-resistant porcine mucin, a high molecular weight glycoprotein which is one of the most stable components of striated muscle (meat).

The **Disp&FLOW – Pork-rcppm** test is based on the immuno-chromatographic, portable, and rapid technique known as lateral flow. The target antigen sought in the sample is bound – from the start of the migration along the dipstick – by specific antibodies attached to colored gold microparticles. This antigen-antibody complex migrates to the test line where it binds to another specific antibody to form a colored line indicating a positive result. The presence of a second, 'control' line ensures that the device works properly.

The test is applicable to the qualitative detection or semi-quantitative measurement of target antigens in complex food samples and surface swabs. Such qualitative detection is generally carried out for screening or process verification purposes and semi-quantitative measurement is applied for monitoring or comparative studies.

Test specificity and sensitivity

The sensitivity (LOD, limit of detection) of the **Disp&FLOW – Pork-rcppm** test in the extract prepared according to the present instructions is **approximately 500 ppm wet weight** of raw, unprocessed ground meat **or 0.5 % pork** in a mixture of meat homogenates. This corresponds approximately to the detection of 5 to 10 mg of pork per kg of solid matter (5 to 10 ppm).

In dry places or other types of materials collected by wet swabs according to the present instructions, the LOD of the **Disp&FLOW – Pork-rcppm** test is approximately **1.7 mg / 100 cm²** for total pork protein.

Note: Sensitivity is calculated for the target antigenic material contents in the solid material extracted by the method described below (solid/ liquid ratio 1:10 weight / volume). The sensitivity of the test can be improved by lowering the liquid-to-solid ratio, but this must be handled cautiously since it can result in a thicker liquid that will no longer migrate into the test strip properly.

The **Disp&FLOW – Pork-rcppm** test shows negative results in homogeneous (non-adulterated) meat of the following species: cow (beef), sheep, horse, elk, reindeer and other deer meat, chicken and other poultry, rabbit, kangaroo, dog, and cat. The test is also negative for human muscle tissue.

Important note: The test will give **false negative results** with meat products treated with **long-term salting or smoking** (more than three months) (examples are certain hams such as Aosta Valley ham, prosciutto, etc.), seasoning or pheasanting. To check the presence of pork in these products, we recommend using the **Disp&FLOW– Pork – fat / blood / pork** test (ref. BIO.026.1).

If the visual test gives unclear results (e.g. a weakly colored test line), we recommend rechecking the porcine antigen presence by another, more quantitative laboratory method, e.g. ELISA or PCR.

Kit contents

The **Disp&FLOW – Pork-rcppm** test kit contains the following components:

- 1 test strip packaged in a hermetically sealed foil pouch containing a desiccant,
- 1 sampling swab (surface test),
- 1 polypropylene test tube,
- 1 transfer pipette
- 1 instructions for use

Storage and stability

- The kit should be stored between +2°C and +30°C in a dry environment, away from direct sunlight.
- **The strip must not be frozen and should be kept in its hermetically sealed foil pouch.**
- The kit must be used before the expiration date indicated on the packaging.

Equipment required but not supplied

- Sampling spatula, preferably single-use.
- Pair of gloves
- Precision weighing tool or digital dosing spoon (optional, see ref. BIO.044.1)

Precautions

- Kit components are for *in vitro* use only. Do not ingest anything.
- Heat-sealed pouches containing the test strips should be **stored between +2°C and +30°C**.
- **Strips must be stored in their hermetically sealed foil pouch** (strips are highly sensitive to moisture) – Do not use a strip more than 10 minutes after opening the pouch.
- The kit may be used until its expiration date if its components have been stored under the recommended conditions until then.
- Do not use the kit beyond its expiration date.

- All handling associated with the use of this test must be carried out in strict compliance with the conditions for non-contamination of samples; in particular, gloves must be worn during handling.
- Once the pouch is opened, the strip must be handled by its upper colored part. Do not directly touch the central part of the strip or its absorbent end.
- Do not undertake the test if you find the foil pouch torn when deciding to use the kit.
- Proceed with care when opening the foil pouch (see test procedure) and avoid cutting or damaging the test strip.
- Use only the test-tube supplied in the kit. Never use components from different kits.
- **Do not immerse the strip deeper than the line under the arrows.**
- The **Disp&FLOW – Pork-rcppm** test contains only single-use components; do not use again.

Waste disposal

- Dispose of all used consumables in accordance with food industry or bio-agronomic waste regulations.
- Each user is responsible for managing the waste produced by their activity and must ensure that they are disposed of in accordance with current applicable regulations.

Sample preparation

Prior to testing, allow the kit components to reach the room temperature for 5 to 10 minutes. Samples (as well as the test strip) should be brought to a temperature of between +18°C and +35°C; analysis of colder samples reduces test sensitivity; analysis of warmer samples is not possible due to the risk of degradation of the antibodies present in the strip.
Ensure that the material to be tested is a mixture of all the ingredients making up the final solid food product.

If testing solid foods, we recommend the following procedure:

1. Using clean, sharp tools (preferably disposable), cut and weigh a small piece **(0.1 to 0.5 g)** of the material to be tested and place it in the test tube. Record the actual weight.
2. If an accurate volume-measuring tool (pipette) is available, calculate the volume of tap water (at +18°C to +35°C) required as 10 times the actual weight (e.g. if the weight is 0.31 g, add 3.1 mL of water). Otherwise, add **no more than** half the tube volume of water. Adjust the solution if the weight/volume ratio is too far from 1:10.
3. Hermetically seal the test tube with the cap.
4. Vigorously shake the test tube manually or by vortexing at maximum speed for 15 to 30 seconds.
5. Place the tube upright on a rack and allow the contents to settle (approximatively 2 minutes) or centrifuge at low speed, the supernatant is then ready for testing.

For surface testing of solid materials, utensils or other testing from benchtops, we recommend the following:

1. Add 1 mL of tap water (+18°C to +25°C) to the test tube.
2. Place the swab in the tube containing tap water and squeeze any excess liquid against the wall of the tube.
3. Pass over the surface of the object to be analyzed (paying particular attention to suspicious marks) by making a cross movement, in one direction then the other, then diagonally.
4. Return the swab to the test tube and meticulously disperse the liquid contained in the swab head. Then shake vigorously for 15 to 30 seconds.
5. Remove the swab and seal tightly the test tube with cap.
6. Shake vigorously for 15 to 30 seconds or use the vortex.
7. Place the tube vertically on a rack and let sediment the contents of the tube (about 2 minutes) or centrifuge at low speed in a centrifuge, the supernatant is then ready for the tests.

Liquid samples can be tested directly.

The test detection limit for liquid samples depends on their viscosity and turbidity (presence of particles). If the sample is viscous and cannot reach the test zone, it must be diluted with tap water. In this case, the sensitivity of the test must be adjusted by the dilution factor. Cloudy specimens should be filtered through a textile or paper filter.

1. Take 1 mL of liquid sample (using a laboratory pipette) and drop it into the test tube. Use only disposable materials; replace them for each new sample or preparation of a new sample.
2. Add an equal volume of tap water (at 18°C to 35°C).
3. Hermetically seal the test tube with the cap.
4. Vigorously shake the test tube manually or by vortexing at maximum speed for 20 to 30 seconds.
5. Place the tube upright on a rack and allow the tube contents to settle, or centrifuge at low speed in a centrifuge, leaving the supernatant ready for testing.

Test procedure

Reminder: samples to be at a temperature of +18°C to +35°C

1. **If kit taken out of the fridge: remove the foil pouch (without opening it) and leave at room temperature for 5 to 10 minutes.**
2. Open the pouch containing the test strip, taking care not to cut the strip.
3. Grasp the strip by the upper colored part and dip the other end vertically into the test tube superna-tant. **Caution**: make sure the strip is **not immersed too deeply** – See picture opposite. →

4. Leave the strip to soak for **20 to 30 seconds**, then place it on a **CLEAN**, horizontal surface; do not touch or move the strip for 10 minutes, while the sample migrates.
5. Read the result and interpret it according to the picture and instructions below.

Interpretation of results

The test is positive if 2 red lines appear clearly in the central area of the strip (test line and control line, see below). Disregard the order of appearance of the 2 lines and any nuances in color intensity.

The test is negative if a single red line appears (see below): this is the control line which guarantees that the test is working correctly.

If only the test line appears (see below), the test cannot be interpreted, and no result is validated.

If no line appears (see below), the test cannot be interpreted, and no result is validated.

In the latter two cases, before starting again with another **Disp&FLOW – Pork-rcppm** test, make sure that all the test preparation, storage and application instructions have been followed, as well as the expiration date.

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