The Botvanger

Simple diagnosis of liver fluke eggs in fecal samples

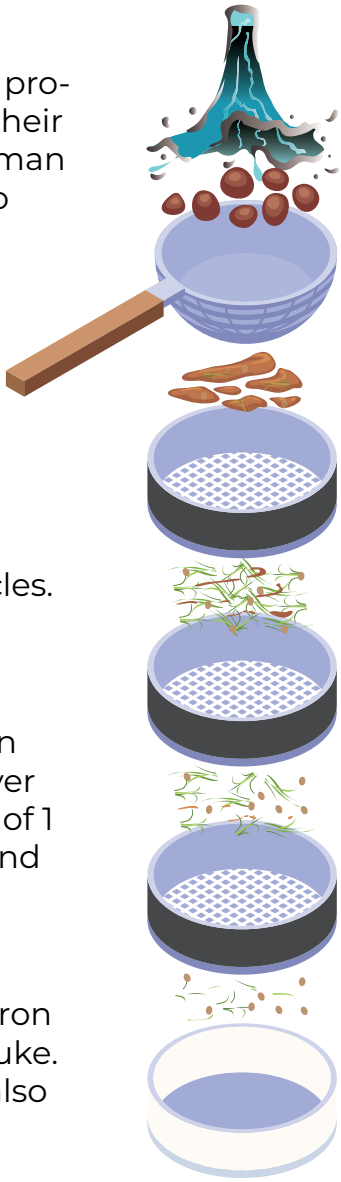


USER MANUAL

Working with the Botvanger

Diagnosis of liver fluke and rumen fluke

With the Botvanger, veterinarians, extension agents, and livestock producers can easily diagnose liver fluke or rumen fluke infection on their own. The method is based on sifting fecal samples using the Dorsman method, in which coarse and fine manure particles are removed to make trematode eggs visible.



Procedure

By rinsing the material from the bottom sieve and allowing it to settle, the eggs can be easily identified under 25-40x magnification. Methylene blue helps distinguish between liver fluke eggs and rumen fluke eggs. The approach varies by animal species:

- Sheep feces are sedimented several times to remove fine particles.
- Cow and horse feces usually require only one sedimentation.

Sensitivity of the method

An adult liver fluke produces approximately 20,000 eggs per day. In sheep, a loss of production occurs when there are more than 30 liver flukes in the liver (EPG = 300). The Botvanger has a detection limit of 1 egg per gram of fecal sample and is even more sensitive in cows and horses due to the coarse-fibrous structure of their feces.

Rumen fluke and other worm eggs

The Botvanger also detects eggs from the rumen fluke (Calicophoron sp. or Paramphistomum sp.), which is less harmful than the liver fluke. Other worm eggs, such as those from Nematodirus species, may also be visible, but the McMaster method is more suitable for gastrointestinal worms.

Parts and usage

The Botvanger consists of four parts:

Lid
Mesh 1 (biggest part)
Mesh 2
Mesh 3

The sieves are fragile and must not be touched with fingers or instruments. There are ventilation holes beneath sieves 1 and 2 to prevent a vacuum from forming. Make sure no liquid leaks out of these holes during rinsing; if necessary, seal them with your thumbs.



Step-by-step guide to the Botvanger method for diagnosing liver flukes and rumen flukes

	What to do	Note
1	Collect 2–3 droppings from at least 10 sheep, or equivalent amounts of fecal samples from cows or horses, and place them in a plastic bag. Mix them thoroughly by kneading.	Use a fresh fecal sample. If collecting it from the ground, gather droppings that have just fallen.
2	Weeg 8 gram gemengde schapenmest of 10 gram koeien-/paardenmest in een bekertje en voeg water toe. Pureer de mest met een spatel en meng zorgvuldig tot een gladde vloeistof.	Weigh out 8 grams of mixed sheep droppings or 10 grams of cow or horse feces into a small cup and add water. Mash the manure with a spatula and mix thoroughly until it becomes a smooth liquid.
3	Pour the mixture through the sieve into a large cup and rinse the sieve thoroughly with water. Squeeze the sample well through the sieve (using a teaspoon or spatula).	De wormeieren zitten nu los in de vloeistof. Gebruik een grote beker en spoel met veel water. Al het spoelsel wordt gebruikt om verder te zeven.
4	The worm eggs are now floating freely in the liquid. Use a large cup and rinse with plenty of water. All of the rinse water is used for further sifting.	Liverbot eggs collect on the bottom mesh (mesh 3). Tapping prevents too many eggs from getting stuck or the sieves from becoming clogged. Make sure the ventilation holes do not become blocked.
5	Remove the top mesh (1). Rinse mesh 2 and 3 thoroughly with water.	
6	Remove mesh 2. Turn mesh 3 upside down over a plastic coffee cup so that the cup completely covers mesh 3. Pour a little water onto the bottom of the mesh and lift it slightly so that the water falls through the mesh into the cup all at once. Repeat this twice and fill the cup with water to a height of about 8 cm.	The liver bot eggs have now been collected on mesh 3. You can also use a tapered glass to concentrate the eggs at the tip.
7	Let it settle for 3 minutes. Then pour off the liquid until only a small amount of water with sediment remains at the bottom. If the liquid still looks very dirty, this process can be repeated.	Liver fluke eggs sink about 10 cm per minute. You can drain them until 5–6 ml of liquid remains. This removes as many fecal particles as possible.
8	Transfer the sediment to a small Petri dish. Rinse the beaker or test tube with a little water and add 1–2 drops of methylene blue.	Make sure everything fits in the dish. This takes a little practice.
9	Mix the liquid in the bowl and make sure that no concentration of fecal particles forms in the center.	
10	View under a microscope at 40x magnification.	First, clamp an empty microscope slide to the cross table and place the Petri dish on top of it. This helps facilitate a systematic search for liver fluke eggs.

Getting Started: Step-by-Step Guide for the Botvanger Method

Preparing the sieves:
- Stack sieves 1, 2, and 3 on top of each other (sieve 1 on top, sieve 3 at the bottom).
- Briefly moisten the sieves under running water.

Preparing the fecal sample:
- In a cup, mix 8 g of sheep feces or 10 g of cattle/horse feces with approx. 150 ml of water until a smooth suspension is formed.
- For hard sheep pellets: crush them first in 50 ml of water, then top up to 150 ml.

Filtering the feces:
- Pour the mixture through a coarse sieve into a beaker or pitcher.
- Rinse the cup with water and pour this through the sieve into the pitcher as well.
- Thoroughly rinse the feces in the sieve with plenty of water and press out any remaining fecal residue.

Using the Botvanger:
- Pour a portion of the liquid into the Botvanger.
- Tap the Botvanger against the sink to help the water pass through the sieves.
- Hold the Botvanger at an angle with the ventilation holes facing upward.
- Repeat this process with the remaining liquid and thoroughly flush the Botvanger.

Rinsing and sedimentation:
- Rinse the Botvanger several times until the outflowing liquid runs clear.
- Remove sieve 1 and rinse sieves 2 and 3 again.
- Then remove sieve 2 as well, keeping sieve 3 (which holds the captured parasite eggs) separate.

Collecting the eggs:
- Invert sieve 3 over a cup (e.g., a paper cup) and rinse with a gentle stream of water to collect the eggs into the cup.
- Fill the cup with water to a height of approx. 8 cm and allow it to settle for 3 minutes.
- Carefully decant the supernatant until only a thin layer of water with sediment remains.
- If excessive fine fecal debris is present: divide the sediment into test tubes and allow it to settle for 2 minutes.

Sample analysis:
- Pour the concentrated sediment into a Petri dish.
- Add 1 drop of methylene blue and swirl gently to mix.
- Examine the sample under a microscope (25–40x magnification).

Liver fluke (Fasciola) eggs appear yellow-brown; rumen fluke (Paramphisto-

mum) eggs appear silvery/light gray.

Cleaning and maintenance:

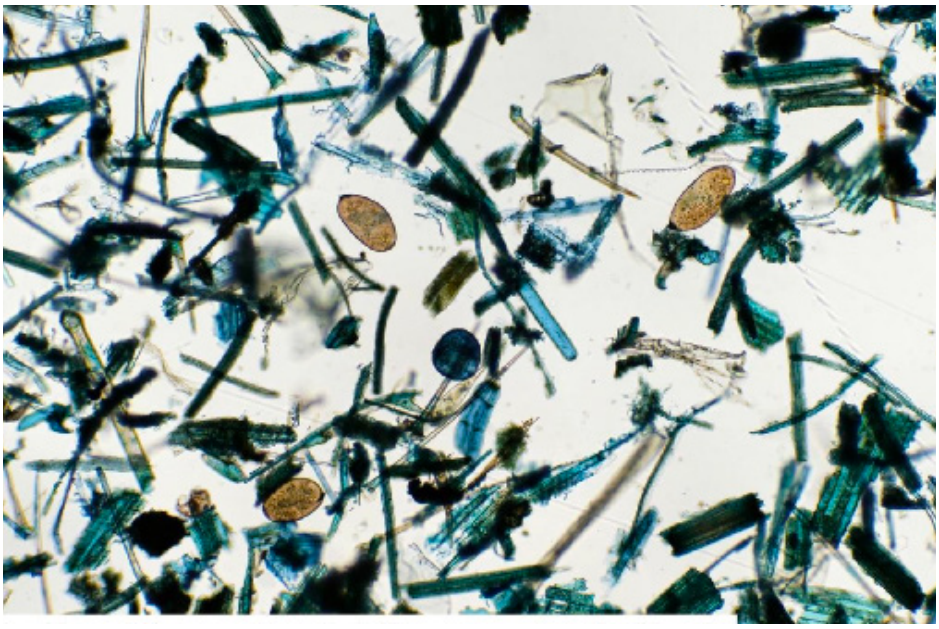
- Thoroughly rinse all parts of the Botvanger with cold water.

Do not use tools or a dishwasher to clean the sieves.
The Botvanger is ready for immediate reuse after rinsing.

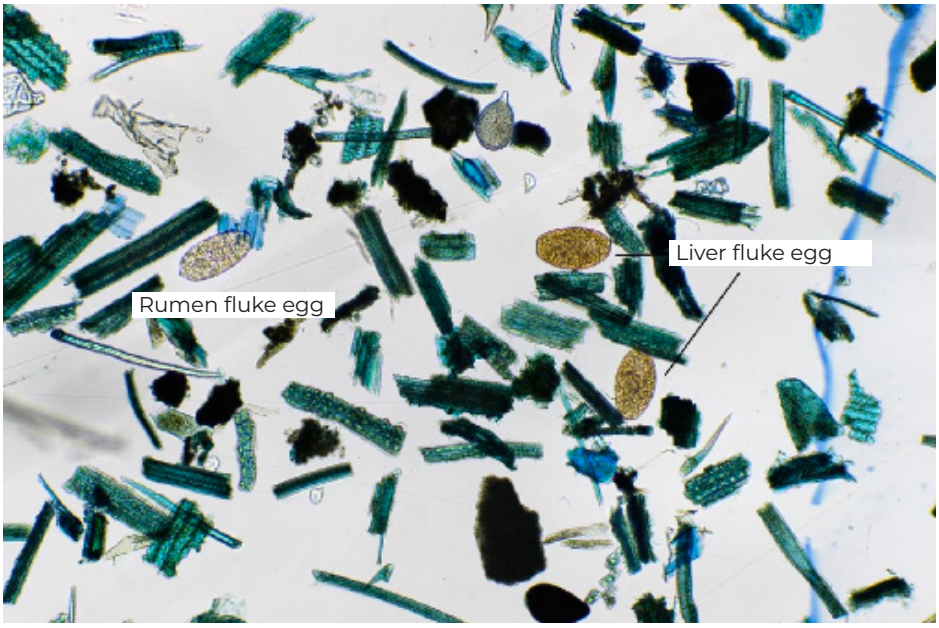
Tip: Etch a grid onto the bottom of the Petri dish for easier analysis.
Want to know more?

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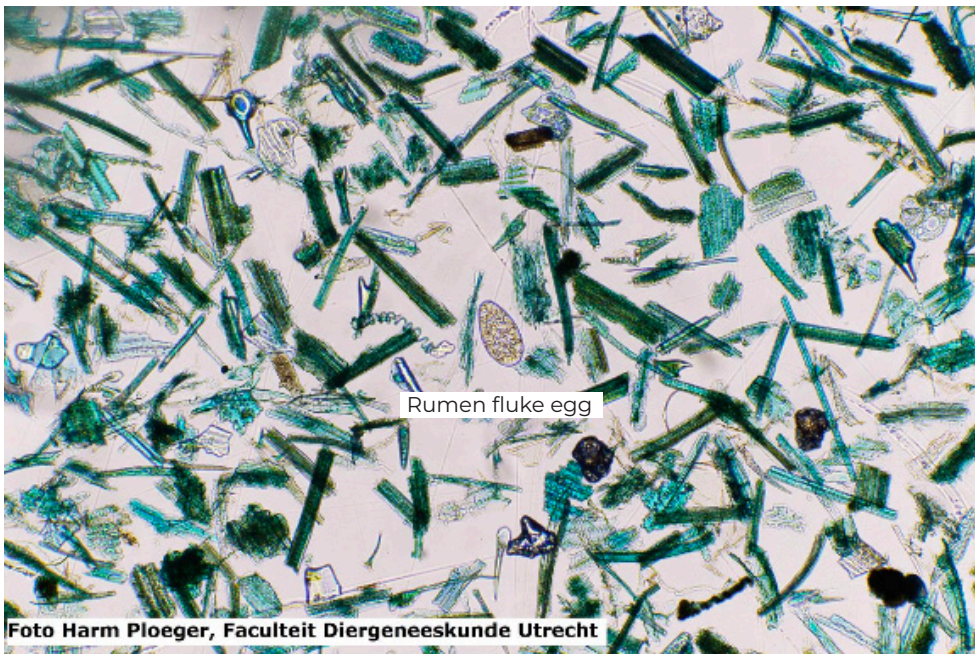
Liver fluke eggs in sheep feces, 100x magnification



Liver fluke eggs and rumen fluke eggs, 100x magnification



Rumen fluke egg, 100x magnification



Liver fluke eggs in sheep feces 40x magnification

