McMaster Method

Method with an electric stir plate

- Method using a magnetic stir bar, a 100-mL beaker, and flotation medium with a precalibrated counting chamber (Advanced Equine Products, 5004 228th Ave. SE, Issaquah, WA 98029)

1. Place beaker on balance, tare it, and weigh out of feces into the beaker.
2. Add approximately 10 mL of the magnesium sulfate solution, and mix well using applicator sticks or a tongue depressor to break up the fecal matter much as possible.
3. Bring the volume to 60 mL with additional flotation medium, and add a stir bar. Stir for 5 minutes at moderate speed.
4. Using a glass slide to make a score mark, score a pasture pipette halfway between the tip and the barrel and break off the tip to produce a wider bore. (Caution: Pasteur pipettes have caused numerous laboratory accidents; use with care).
5. Load the pipette with the fecal material from the stirring beaker, and fill both chambers on the precalibrated counting chamber.
6. Let the preparation stand 5 minutes to allow the eggs to float to the surface, and then count all eggs within the grids of both chambers using the 10X objective.
7. Calculate eggs per gram of feces by multiplying the total number of eggs counted in the two chambers by 50.

Solutions

- Salt – Saturated Sodium Chloride (NaCl)
  - Specific Gravity 1.2
  - Use pickling salt – does not containg Calcium chloride to keep it from clumping (this makes it cloudy
  - Destroys thin-walled objects
  - Does not float significant debris
- Magnesium sulfate – Epsom salts [Also, can use Zinc Sulfate, can purchase solution at sp.g. = 1.18]
  - If make your own, requires determination of specific gravity – can set between 1.0 and 1.3
  - Protects the thinner shelled objects from dehydration
  - Has the advantage that can adjust the specific gravity
- Sugar – Saturated Sucrose
  - Specific Gravity 1.27 to 1.30
  - Hygroscopic – (attract water molecules from the surrounding environment) – so, with high humidity will become more dilute with time.
  - Often need to add formalin or phenol to prevent mold growth
- Potassium Dichromate -

Table 1
Flotation solutions—compositions and densities

Flotation solution	Composition	Density
S1, sucrose and formaldehyde	$C_{12}H_{22}O_{11}$ 454 g, CH_2O solution (40%) 6 ml, H_2O 355 ml	1.200
S2, sodium chloride	NaCl 500 g, H_2O 1000 ml	1.200
S3, zinc sulphate	$ZnSO_4 \cdot 7H_2O$ 330 g, H_2O brought to 1000 ml	1.200
S4, sodium nitrate	$NaNO_3$ 315 g, H_2O brought to 1000 ml	1.200
S5, sucrose and mercury II iodide and potassium iodide	Solution A ($C_{12}H_{22}O_{11}$ 600 g, H_2O 600 ml) + 20 ml Solution B (KI 78 g, HgI_2 100 g, H_2O 63 ml)	1.250
S6, magnesium sulphate	$MgSO_4$ 350 g, H_2O brought to 1000 ml	1.280
S7, sodium nitrate and sodium thiosulphate	$NaNO_3$ 250 g, $Na_2O_3S_2 \cdot 5H_2O$ 300 g, H_2O brought to 1000 ml	1.300
S8, zinc sulphate	$ZnSO_4 \cdot 7H_2O$ 685 g, H_2O 685 ml	1.350
S9, sodium chloride and zinc chloride	NaCl 210 g, $ZnCl_2$ 220 g, H_2O brought to 1000 ml	1.350
S10, sucrose and sodium nitrate	$C_{12}H_{22}O_{11}$ 540 g, $NaNO_3$ 360 g, H_2O brought to 1000 ml	1.350
S11, mercury II iodide and potassium iodide	KI 111 g, HgI_2 150 g, H_2O 399 ml	1.440
S12, sodium nitrate and sodium thiosulphate	$NaNO_3$ 300 g, $Na_2O_3S_2 \cdot 5H_2O$ 620 g, H_2O 530 ml	1.450
S13, zinc sulphate and mercury II iodide and potassium iodide	Solution A ($ZnSO_4 \cdot 7H_2O$ 600 g, H_2O 600 ml) + Solution B (KI 78 g, HgI_2 100 g, H_2O 63 ml):	1.450
S14, sucrose and sodium nitrate and sodium thiosulphate	$C_{12}H_{22}O_{11}$ 1200 g, $NaNO_3$ 1280 g, $Na_2O_3S_2 \cdot 5H_2O$ 1800 g, H_2O 720 ml	1.450

Cringoli, G., Rinaldi, L., Veneziano, V., et al. 2004. The influence of flotation solution, sample dilution and the choice of McMaster slide area (volume) on the reliability of the McMaster technique in estimating the faecal egg counts of gastrointestinal strongyles and *Dicrocoelium dendriticum* in sheep. Veterinary Parasitology 123: 121-131

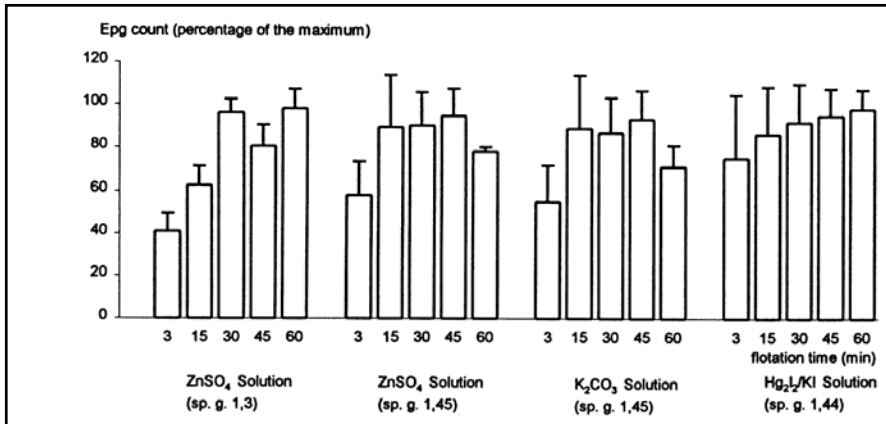

Fig. 1. Egg count of *Dicrocoelium* at each point in time expressed as percentage of the maximum achieved over the time course (mean and standard deviation)

Significant best rate of recovery, 91.2 ± 9.4 %, was achieved using HgI_2/KI solution for flotation and there was no significant influence of flotation time on the egg count. Utilizing $ZnSO_4$ solutions and K_2CO_3 solution for flotation the rates of recovery for *Dicrocoelium* eggs were 9.0 ± 7.1 %, 26.7 ± 24.9 % and 13.0 ± 11.6 %, respectively, and a flotation time of more than 3–5 min did significantly increase the number of floated eggs. The rate of recovery for *Dicrocoelium* eggs using the sedimentation technique was 41.2 ± 1.5 %.

Rehbein, S., Kokott, S., Lindner, T. 199.9 Evaluation of techniques for the enumeration of *Dicrocoelium* eggs in sheep faeces. Journal of Veterinary Medicine. A 46: 133-139