

Equipment - When Working in the Field

By John E Cooper DTVM FRCPATH FIBiol FRCVS & Zoe Belshaw BA VetMB MRCVS

The detailed contents of field kits will depend upon the location and the type of investigations being carried out. A detailed description of a general diagnostic kit, suitable for various types of veterinary work, was provided by Frye, Cooper and Keymer (2001) and in the forthcoming book about forensic veterinary medicine by Cooper and Cooper (2007) and some data from those publications are reproduced here, with permission.

The following items are recommended in the field for:

- a) clinical
- b) post-mortem, and
- c) laboratory

diagnostic work.

In each case the list should be supplemented with general items, as above.

a) Clinical equipment - when live animals have to be examined

- Stethoscope (lightweight)
- Auriscope (otoscope) (lightweight)
- Ophthalmoscope (lightweight)
- Rigid endoscope (battery-operated)
- Pen torch (flashlight)
- Spare bulbs and batteries
- Syringes and needles (disposable)
- At least one boilable, re-usable syringe and needle
- Empty drinks cans, labelled 'sharps boxes', for used needles, scalpel blades, etc.
- Disinfectant(s), including ethanol
- Camping (gas cylinder-operated) stove – for sterilising, lighting and cooking
- Pressure cooker for sterilising
- Selected medicines, including local analgesics, sedatives and agents for euthanasia (plus gun if large animals may need to be killed)
- Cotton wool
- Dressings
- Suture materials
- Basic surgical ('cut-down') set and other instruments as necessary
- Disposable skin-biopsy punch
- Cautery (battery-operated)
- Clippers for claws, talons, beaks
- Ring (band) remover

- Spring balance(s) or battery-operated scales
- Cloth bags and other devices for restraining small animals
- Gloves - surgical and for handling
- Towel
- Oesophageal and other tubes
- Mouth gag/wooden spatulae
- Aluminium foil
- Sampling and other equipment for laboratory work (see later – list c))

b) Post-mortem equipment – when dead animals have to be examined

- Standard necropsy items – portable/folding, lightweight/plastic where appropriate
- Saw(s)
- Scalpels and blades
- Knives
- Forceps
- Probes - solid and flexible (rubber)
- Scoops for brain, etc.
- Pen torch (flashlight)
- Spare bulbs and batteries
- Syringes and needles (disposable)
- Empty drinks cans, labelled 'sharps boxes', for used needles, scalpel blades, etc.
- Disinfectant(s), including ethanol/methanol/methylated spirits
- Camping (gas cylinder-operated) stove – for sterilising, lighting and cooking
- Pressure cooker for sterilising
- Cotton wool
- Spring balance(s) or battery-operated scales
- Scalpel handle and disposable sterile blades of several sizes and shapes.
- Dissecting scissors, curved haemostatic forceps, toothed and smooth-jawed fine-pattern thumb forceps and bone forceps
- Sampling and other equipment for laboratory work (see later – list c))

c) Laboratory equipment

- Microscope (solar or battery-operated)
- Immersion oil (or methyl salicylate) with swabs and xylene for cleaning
- Pre-cleaned, frosted, ground-ended microscope slides and slide box or tray
- Pencils for marking glass slides
- Diamond-tipped pen for marking glass slides (if frosted not available)
- Worm-egg counting slide
- Coverslips
- Lens tissues
- Saline, saturated NaCl solution and other reagents for parasitology
- Transparent polythene strips and methylene blue/malachite green for the KATO method of cleaning faecal films for parasites, ova and cysts
- Fixatives - alcohol, formalin
- Selected stains for cytology
- Lightweight (plastic) staining jar or staining rack

- Urine and blood chemistry test strips
- Portable centrifuge
- Polypropylene capillary tubes, some coated with heparin or EDTA, plus commercial haemoglobin and PCV reader
- Hand-held refractometer
- Transport medium for bacteria, viruses, mycoplasmas and Trichomonas
- Vacuum flask
- Buffer tablets for use – with local water
- Scalpel, scissors, forceps, artery forceps (haemostats)
- Wash bottles for alcohol, stains, etc, etc.
- Lightweight pots for specimens
- Disinfectant(s), including ethanol/methanol/methylated spirits
- Camping (gas cylinder-operated) stove – for sterilising, lighting and cooking
- Pressure cooker for sterilising

Equipment - when working with equids

- Hoof knives
- Tape Measure
- Allis forceps
- Stethoscope
- Thermometer
- Dressing scissors
- Stitch Kit: scalpel handle, scalpel blades, scissors, forceps – rat-toothed and plain, 2-4 pairs artery forceps, needle holders
- Container to boil and sterilise equipment in
- Suture material
- Tourniquet
- Dressings - melonins, crepe bandages, cotton wool, poultice and vet wrap
- Protective gloves - rectal and latex hand gloves
- Torch
- Stomach tubes - 2-3 sizes
- Foaling / calving ropes and lubrel
- Catheters - 14G and 18G
- Needles and syringes
- IV catheter (giving hit)
- Recipe for oral re-hydration
- Trochar and cannula (bloat guard)

Recommended additional items when working overseas in the field

(Sharp and other possibly dangerous items should not be placed in hand luggage when travelling by air or through land or sea security checkpoints)

- Emergency pack containing business cards, letters of authorisation, protocols for snakebite (etc.), medicines and antidotes
- Multipurpose Swiss Army-type pocket knife
- Sewing kit with assorted needles, thread
- Screwdrivers, pliers and an adjustable spanner

- Elastic bands, string, dental floss, suture material, adhesive tape, insulating tape, duct tape, electrician's tape
- Spare nylon cable ties for securing lid hasp of case during travel
- Standard veterinary and other textbooks: where space is limited, the 'Merck Veterinary Manual' is recommended
- Phrase books of appropriate languages
- The 'SAS Survival Guide' (Wiseman, 1993), which contains much useful information that can be applied to difficult situations in the field
- Appropriate clothing, e.g. the shoulders should be covered when working in a Muslim community, a tie is a courtesy in most countries when meeting dignitaries

More specialised laboratory investigations in the field

- Vacuum flasks and portable, lightweight, cool-box
- Normal (isotonic) saline
- Hypertonic NaCl or sugar (sucrose) solution for flotation/sedimentation examination
- Tincture of merthiolate for staining faecal protozoa
- Fixatives for blood and other body fluids, bone marrow and endo- and ectoparasites
- Rapid-acting stains for blood and other body fluids (sputum, urine, synovial and coelomic, cerebrospinal, bone marrow, etc.) and touch/impression smear cytology
- Gram, acid-fast and other special stains
- Lactol-phenol cotton-blue for demonstrating fungi
- Plastic pipettes
- Slotted stain jar. Lightweight, unbreakable plastic staining jars are preferable to heavy, fragile, glass Coplin jars
- Mounting media for permanent preparations of blood and bone marrow films
- Clearing and mounting media for small ectoparasites
- Light-weight, slide-drying rack
- Transport media for bacteria, viruses and protozoa (see earlier)
- Microbiological test strips
- Urine and blood chemistry test strips
- Rapid diagnostic test strips
- Cardboard strips, which can be labelled in pencil or waterproof ink, and placed inside specimen containers
- Safety matches, a small Bunsen burner or disposable butane cigarette lighter
- Squeeze bottles for methanol, etc.
- Specimen containers, filled with concentrated formaldehyde, for dilution with river or sea water
- Tongue depressors, wooden applicator sticks, and sterile cotton-tipped applicators. Plastic coffee spoons for use as spatulae (see text)
- Non-lubricated condoms as finger covers
- Plastic film canisters (pots) with labels attached for faecal collection, parasites, etc. They usually can be obtained gratis from film dealers or photofinishing laboratories
- Sterile disposable venous and urethral catheters; latex or plastic tubing
- Plastic slide boxes, each prefilled with polished, frosted, glass microscope slides

Checklist of battery-operated or solar-powered (direct sun or solar panels) equipment that can be used in isolated locations

- Miniaturised otoscope (auriscope)
- Ophthalmoscope
- Rigid endoscope
- Colorimeter
- Electrocautery
- Blood-pressure monitoring instrument
- Minicentrifuge
- Miniphotometer
- Respiratory monitor and pulse oximeter
- Refractometer

References to Literature

1. Cooper, J.E. and Cooper, M.E. (2007). "Introduction to Veterinary and Comparative Forensic Medicine". Blackwell, Oxford (In Press).
2. Frye, F.L., Cooper, J.E. and Keymer, I.F. (2001). Outfitting and employing a compact field laboratory. *The Bulletin of the British Veterinary Zoological Society* 1(2).
3. Wiseman, J. (1993). "SAS Survival Guide". Harper Collins, Glasgow.