

Table 5. Cattle parasites -summary (adapted from Cole 1986)

Parasite, length, location	Gross pathology	Clinical signs	Significant faecal egg counts (FECs) and worm counts (WC); other
<i>Haemonchus placei</i> . 10-30mm. Abomasum.	Blood clots and mild abomasitis in heavy infections. Red and white 'barbers pole' appearance of females; worms clearly visible. Light infections: no gross lesions.	<i>Heavy infections</i> Mainly in young cattle in summer rainfall areas. Usually with <i>Oes. radiatum</i> and <i>Cooperia spp.</i> Exercise intolerance. Anaemia, submandibular oedema. <i>Light infections</i> Ill thrift, mild anaemia.	<i>FECs</i> 700-1500+ may be clinically significant. Eggs typically strongyle. <i>WCs</i> Heavy infections: 5 000-10 000+ worms. Mainly in calves. Generally less important than <i>Haemonchus</i> in sheep.
<i>Ostertagia</i> spp - 'small brown stomach worm'. 6-10mm. Abomasum.	An important pathogenic parasite of young and adult cattle. Larvae entering gastric glands produce small white crater-like nodules which coalesce to give mucosa 'morocco leather' look. Inflammatory response with oedema and congestion when larvae emerge from glands. Type I and II lesions similar. Gross distension of folds seen in type II.	Type I affects young dairy calves and beef weaners in post-weaning period. Type II affects yearlings, pregnant heifers and old cows. Typical acute symptoms: anorexia, severe weight loss, scouring, submandibular oedema and deaths depending on severity of infection. Lighter infections: ill thrift, moderate scour.	<i>FECs</i> 300+ may be clinically significant; however significant disease can occur with lower FECs. Counts generally low, up to 1500+. Eggs typically strongyle. <i>WCs</i> Up to 100 000 - 600 000+. Up to 80% may be arrested in type II disease.
<i>Trichostrongylus axei</i> -'stomach hair worm'. 3-4mm. Abomasum.	Infections usually light. Much smaller than <i>Ostertagia</i> and difficult to see. Worms mainly in pyloric region. Gastritis in heavy infections with congestion and ringworm-like lesions.	May contribute to scouring-ill thrift syndrome in mixed/heavy infections.	<i>FECs</i> Counts usually low. Moderate infections may contribute 500-1000 epg to mixed infections. Eggs typically strongyle. <i>WCs</i> Heavy infections: 100 000 - 5000 000 worms.

<i>Trichostrongylus</i> spp. 4-7mm. Small intestine.	Rarely produces lesions or clinical disease in cattle and is an uncommon parasite.		<i>FECs</i> No diagnostic value. Eggs typically strongyle. <i>WCs</i> No information.
<i>Nematodirus</i> spp. - 'thin-necked intestinal worm'. 10-20 mm. Small intestine.	No specific gross lesions. A rare parasite of beef cattle; seen occasionally in dairy calves in mixed infections.	Usually non-pathogenic.	<i>FECs</i> . Eggs large and easily distinguishable from strongyle. Useful for diagnosis. <i>WCs</i> Heavy infections: rare but may be seen in dairy calves (10 000 worms)
<i>Cooperia</i> spp. 5-9 mm. Small intestine.	The most common small intestinal worm. Usually in mixed infections with <i>Ostertagia</i> (or <i>Haemonchus</i> in (sub) tropical areas. Heavy infections are pathogenic for young calves. Catarrhal enteritis, patchy necrosis, haemorrhages. Emaciation.	Mainly in calves: Intermittent diarrhoea, ill thrift. Listlessness, death. Usually in mixed infections.	<i>FECs</i> Counts in young calves up to 1000 - 5000. In acute disease, from 10 000 - 30 000. Eggs typically strongyle. <i>WCs</i> Heavy infections (eg dairy calves): 50 000 - 200 000 worms.
<i>Bunostomum phlebotomum</i> - 'hookworm'. 10-28 mm. Small intestine.	Infection can be percutaneous. Focal haemorrhages in intestinal mucosa, and lungs, though which larvae migrate en route to the gut. Variable anaemia. Parasite's large buccal capsule strips off villi, producing inflammation and exudation. Mainly affects dairy calves in (sub) tropical coastal areas.	Dull demeanour, anaemia, submandibular oedema, dark foetid scour.	<i>FECs</i> 500 - 800 in heavy infections. Eggs typically strongyle. <i>WCs</i> 100-500+ may cause ill thrift, anaemia in young dairy calves.

<i>Strongyloides papillosus</i> . 4-6 mm. Small intestine.	Common in dairy calves in Queensland, especially if cross grazed with lambs. Percutaneous infection occurs. Calves can become heavily infected, but infections rapidly eliminated naturally.	Heavy infection said to produce 'white scour' syndrome.	<i>FECs</i> Eggs smaller than common strongyles and embryonated. <i>WCs</i> Infections of 5000 worms have been found in calves.
<i>Trichuris</i> spp - 'whipworm'. 40-80 mm. Caecum.	Not a serious parasite of cattle. Pathogenic importance unknown.	Usually non-pathogenic.	<i>FECs</i> Generally low but useful to diagnose presence of <i>Trichuris</i> . Eggs characteristic (brown with transparent polar plugs). <i>WCs</i> Several hundred in heavy infections but hard to count as worms clump together.
<i>Oesophagostomum radiatum</i> - 'nodular worm'. 14-22 mm. Colon.	Very pathogenic parasite. Common in young cattle 4-12 months old in tropical and sub-tropical areas. Third stage larvae form nodules, mainly in ileum but also caecum and colon. Colon thickened, oedematous. Excess mucus.	Heavy infections: weight loss, scour, anaemia, submandibular oedema, and death. Histiotrophic phase may also cause ill-effects.	<i>FECs</i> Low counts usual: 300-500. A count of 500 may be significant. Eggs typically strongyle. <i>WCs</i> Heavy infections: 1500 - 4000 worms. Light to medium: 500 - 800.
<i>Oesophagostomum venulosum</i> - 'large bowel worm'. 11-24 mm. Caecum.	Not an important parasite of cattle. Usually present in small numbers.	Relatively non-pathogenic.	<i>FECs</i> Uncertain significance. Eggs typically strongyle. No value for diagnosis.
<i>Chabertia ovina</i> - 'large mouthed bowel worm'. 14-20 mm. Colon.	Rare parasite of cattle. Occurs in sheep areas, e.g. tablelands of NSW. Pathological lesions have not been reported.	No specific clinical signs reported.	<i>FECs</i> As for <i>Oes. columbianum</i> .

<i>Dictyocaulus viviparus</i> - 'large lungworm'. 40-80 mm. Lungs.	A serious parasite of calves in Europe but relatively unimportant in Australia, although heavy infections are seen in dairy calves. Heavy infections (uncommon): Adults in bronchi and bronchioles cause dark red-grey consolidation of caudal lobes and chronic catarrhal bronchitis.	May cause coughing, weight loss. Often seen in conjunction with gastrointestinal helminthosis.	<i>FECs</i> First stage larvae (with distinctive knob on head) passed in faeces. <i>WCs</i> Blockage of bronchi and bronchioles with white thread-like worms indicative of pathogenic effects.
<i>Onchocerca spp.</i> Brisket, ligamentum nuchae, gastrosplenic ligament.	<i>O. gibsoni</i> forms nodules 10-20 mm in connective tissue of brisket, stifle and hip regions, <i>O. gutturosa</i> mainly in the lig. nuchae, and <i>O. lienalis</i> in the gastrosplenic ligament.	No clinical signs. Lesions may be palpable. Microfilariae in skin snips. Lesions normally detected at meat inspection.	Insect borne (midges).
<i>Thelazia spp.</i> Eye.	White nematode in conjunctival sac, lachrymal ducts, and nasolacrimal canal. Associated with conjunctivitis and keratitis but also found in normal eyes.	Worms behind third eyelid and in lachrymal ducts, so worms are difficult to detect clinically. Larvae recoverable from saline eye washings.	Insect borne (flies).
<i>Toxocara vitulorum</i> Adult worms large: ~20-25 cm. Small intestine.	Rare parasite in Australia. No specific lesions/signs. Adult worms large: ~ 20-25 cm.		<i>FECs</i> Eggs characteristic: spherical with thick pitted outer shell and granular contents.
<i>Ascaris suum</i> Lungs.	Pneumonia. Presence of <i>A suum</i> .	Case reported from South Australia where infected yearling cattle developed respiratory distress. Also Atherton Tablelands (northern Queensland).	

<i>Stephanofilaria</i> spp. Small parasite 2.5 - 4.5 mm long Skin	Found in small cysts (up to 4 parasites per cyst) just beneath skin surface in <i>Bos indicus</i> cattle. Lesions raised circumscribed hairless areas on head, neck, dewlap and sternum.	Cattle rub and scratch lesions.	Insect borne (buffalo fly).
<i>Setaria labiato-papillosa</i> . Adult s 35-100 mm long. Peritoneal cavity	Found in north Queensland. No pathogenic effects. Adult sin peritoneal cavity 35-100 mm long.	Microfilariae found in blood.	Insect borne. Found in north Queensland.
<i>Gongylonema</i> spp. Adults are large nematodes: 60-150 mm long Oesophagus, rumen.	Found in oesophageal and ruminal submucosa or mucosa. No known pathogenic effects. Adults are large nematodes: 60-150 mm long.		
<i>Fasciola hepatica</i> - liver fluke. 20-30 mm. Liver.	<i>Acute fasciolosis</i> (massive infection) Severe anaemia, ascites, haemorrhagic tracts in liver. <i>Chronic form</i> (most common in cattle) Bile ducts fibrosed, thicken	Variable, but usually mild/non-specific in cattle but sometimes with significant production losses. Anaemia and deaths may occur rarely. An important cause of liver condemnations at abattoirs.	<i>FECs</i> Little correlation between FECs and worm burdens. Low counts can be associated with significant production loss. Eggs large yellowish brown, with operculum. <i>Total fluke counts</i> Light infestation up to 50; medium 50-100; heavy >100.
Paramphistomes. 5-12 mm. Rumen, reticulum, small intestine.	Most damage done by immature parasites embedded in or attached to SI mucosa causing erosions, haemorrhage and oedema. Necrosis of ruminal papillae also may occur. Adults provoke little reaction.	Young cattle: Anorexia, watery diarrhoea, submandibular oedema (due to immature paramphistomes). Adult cattle: production loss and mild clinical signs (rough coat, mild anaemia) has been reported (adult parasites).	<i>FECs</i> Low in acute disease. Eggs large, transparent with operculum. <i>Total fluke counts</i> Acute: 10 000 (up to 100 000) immature fluke in SI.

Moniezia spp., Thysaniezia sp. 1-6 m. Small intestine.	Little or no pathology.	Questionable importance. Common, particularly in calves grazed with sheep.	<i>FECs</i> Variable numbers. Eggs medium size, triangular, dark grey. <i>WCs</i> Tapeworms are large but few are present.
Important note: This is an overview only. Egg and worm counts are merely indicative. Opinions vary on levels on the significance of different counts for various worms. Additionally, egg and worm counts need to be interpreted in light of the nutritional and physiological states as well as age of host.			