and the agglutination reaction is magnified because of latex particles.

The results of the present study indicate that both the latex agglutination and modified agglutination are useful for serological diagnosis of toxoplasmosis in equids. A titre of 1:64 in latex agglutination and modified agglutination is specific for *T gondii* infection. Results of the present study also indicate that equids can develop high *T gondii* antibody titres without clinical signs.

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A modified phantom (dummy mount) for stallion semen collection

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Introduction

THE advantages of using a phantom or dummy mount for semen collection from stallions are well described (Kenney and Cooper 1974; Richardson and Wenkhoff 1976; Pickett, Squires, Voss and Wallach 1980).

Aggressively serving stallions often present a problem during semen collection by artificial vagina. The collector usually stabilises the artificial vagina either against the hindquarters of the mare or against the side of the posterior end of the phantom. With vigorous thrusting of the stallion the artificial vagina may move forward along the side of the mare or phantom. Eventually it may slip so far forward that the stallion's hindlegs move around the posterior end of the mare or phantom to be positioned alongside the mount. Many mares become restless in this position and try to move away or kick. Where the stallion adopts this position on a phantom it may lift the front leg on the collector's side over across to the other side to straddle the phantom. This situation is not only dangerous for the collector, but often upsets the stallion which may develop an intense disliking for the procedure and refuse to cooperate during subsequent attempts at semen collection.

Materials and methods

To ensure that the stallion does not leave the posterior end of the phantom during collection, a modification of the phantom was developed. The phantom (Figs 1a to f) is barrel shaped, 120 to 140 cm high, 200 cm long and 60 cm in diameter. It consists of a strong frame of three parallel large bore metal pipes padded with a thick layer of foam rubber which is covered by strong plastic material.

The height of the phantom is adjusted by lifting its legs out of, or lowering them into, large pipes in the ground. A Haupner model artificial vagina is used in the author's clinic. The mounting constructed to hold the artificial vagina in the phantom consists of a large metal pipe just big and long enough to accommodate it. A long dorsal slit was made in the mounting to accommodate the artificial vagina's valve when the former is inserted into position (Fig 1a). The mounting slopes cranioventrally at an angle of 15°. This ensures that semen does not pool inside the vagina but drains off into the collection beaker. A steeper slope upset the stallions too much and often prevented them from ejaculating.

The upper rim of the artificial vagina mounting is 20 cm

Fig 1. Using the modified stallion semen collection phantom. (a) The artificial vagina (AV) is inserted into the posterior end of the phantom (P). The valve (V) and the rubber stopper ring (R) of the AV are clearly visible. The distance (x) between the upper crest of the phantom and the upper rim of the AV mounting should be 20 cm. (b) A stallion, trained to mount the phantom without prior teasing to an oestrous mare becomes aroused upon presentation to the phantom. (c) As the stallion mounts its penis is guided into the AV. (d) Without further assistance the stallion serves into the AV. (e) Should the stallion stop thrusting momentarily a few firm squeezes on the base of his penis restore vigorous thrusting. (f) Upon ejaculation, the stallion relaxes totally, the penis withdraws from the AV into the prepuce and the stallion dismounts at leisure.

below the upper crest of the phantom (Fig 1a). This distance is critical since too long a distance causes a kink in the stallion's penis when it thrusts the full length of the penis into the vagina. If the distance is too short the stallion has difficulty in finding the entrance.

A 1 cm thick metal ring is welded into the inner circumference of the artificial vagina mounting, about 25 cm from the caudal opening. A rubber ring made of hose piping threaded over a large radiator clamp is clamped onto the vagina (Fig 1a). When the artificial vagina is pushed into the mounting the two rings lock against each other to prevent it from moving any further into the phantom.

Once in position the artificial vagina and its beaker are well protected against physical damage, inclement weather and direct sunlight. Using this phantom semen from six different stallions has been collected on a regular basis. The method of Pickett *et al* (1980) was used to train three of the six stallions to become aroused by merely being presented to the phantom without prior stimulation by a mare in oestrus (Fig 1b). The other three stallions were teased by positioning an oestrous mare alongside the phantom and removing it as soon as the stallion attempted to mount. The stallions then usually mounted the phantom and started to thrust.

Sometimes a stallion did not achieve intromission itself and

the collector had to guide its penis into the artificial vagina (Fig 1c). Further assistance was not required and the stallions served independently (Fig 1d). Sometimes a stallion would stop thrusting momentarily. A few firm squeezes of the collector's hand on the base of the penis would usually restore thrusting (Fig 1e).

Upon ejaculation most stallions remained on the phantom until the penis was withdrawn into the prepuce, and then they dismounted at their own leisure (Fig 1f). This contributed largely to a favourable attitude of the stallion to this form of semen collection. The dummy's stability has proved most useful in preventing injuries to personnel, stallions and the artificial vagina.

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phantom and training the stallions. The technical department of the University of Pretoria built the phantom. Photographs were taken by Professor H. J. Bertschinger.

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ABSTRACT

Digestive system and diseases

Ulcerative duodenitis in foals

ACLAND, H. M., GUNSON, D. E. and GILLETTE, D. M. (1983) *Vet. Pathol.* **20**, 653-661.

THIS paper describes the clinical and pathological features of primary duodenitis in foals in its acute, necrotising, perforating form as well as its chronic form with duodenal adhesions and structures.

Seven foals, aged 18 days to three-and-a-half months, had acute necrotising and perforating duodenitis with diffuse fibrinous peritonitis. The foals came from four different farms and showed signs of illness for 0 to three days before death (five cases) or euthanasia (two cases). Clinical signs included diarrhoea, depression, distended abdomen, shock, abdominal pain, teeth grinding and sudden death. Treatment included antibiotics (three cases) and flunixin meglumine (five cases).

A further two foals showed signs of illness for 14 and 16 days respectively. These signs included diarrhoea, gastric reflux, teeth grinding, weight loss and dehydration. Both foals were destroyed after a period of treatment. In all foals, samples of intestine, lung and spleen were taken for histology, bacteriology, immunofluorescence for equine herpesvirus, and negative contrast electron microscopy for viruses, eg, adenovirus and coronavirus.

At post mortem examination, the acute cases showed necrotic grey-green friable areas in the proximal duodenum which consisted of single or multiple annular segments or long antimesenteric bands extending through the thickness of the duodenum and clearly delineated on the serosal surface. Within these areas were round or linear antimesenteric perforations. The necrotic areas were thin (1 mm) whereas the tissue between these bands was thicker than normal.

The two chronic cases showed thickening of the duodenal

wall where large areas of mucosa and submucosa were replaced by granulation tissue. In one case there were also several adhesions. In the areas of the duodenum where mucosa was present there was either moderate or severe villous atrophy with cellular infiltration or fibrosis of the lamina propria. Additional histological lesions included necrosis of lymphoid tissue of the Peyer's patches, large intestinal lymphoid nodules, mesenteric lymph nodes and spleen in all foals examined (six). One foal with serosal adhesions near the bile ducts also had diffuse acute cholangiolitis and peribolular hepatitis, subacute pancreatitis and acute erosive fibrinous inflammation of the large ducts.

E. scherichi coli was isolated from intestinal contents (two cases), peritoneal fluid (one case) and various other tissues (one case). *Enterobacter* species and *Proteus* species were cultured from one foal and rotavirus from another. No equine herpesvirus, adenovirus or coronavirus was found in four cases examined.

The authors believe these to be two forms of the one syndrome and the primary lesions to be the duodenal ones because gastric ulceration is seen fairly frequently at post mortem examination of foals. The cause of the duodenitis is not known but comparisons have been made with lesions seen at *Clostridium perfringens* type B enterotoxaemia in lambs. Stress and treatment with phenylbutazone and other non-steroidal anti-inflammatory drugs may be contributory factors by creating conditions for infection to become established.

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