Technical liaison with other countries 30
Clinical and diagnostic services 30
Import and export control 31
Stock census figures 31
Last year the veterinary laboratory at Kroonstad continued its work on false negative Rose Bengal test reactions (tests used for the diagnosis of bovine brucellosis). To date 143 herds have been blood tested using both the Rose Bengal plate and the complement fixation test. These herds were selected when more than 10% positive Rose Bengal reactions occurred. Of 9,929 samples tested, 0.8% yielded false negative results (negative Rose Bengal and complement fixation test of more than or equal to 30 IU/ml). Although this work has not been completed it would appear as though adult immunisation is one of the biggest causes of this phenomenon.

Allerton Regional Veterinary Laboratory in Pietermaritzburg has isolated the vaccine strain of Brucella abortus (S 19) from the afterbirth of a cow which had calved normally. This beast showed a rising titre in the complement fixation test over a 5-month period. The question regarding the development of serological titres in cows that have had contact with such an afterbirth arises.

Investigations were also made into the occurrence of B. abortus organisms in milk. Three isolates of wild strain and 57 isolates of the vaccine strain were made from 347 milk samples (40 cows, 22 owners).

Low dose vaccine was used in all cases where Strain 19 organisms were isolated. Eighty per cent of the culture positive cows had 784 or more IU CFT antibodies.

Allerton Laboratory was also involved in assisting the Faculty of Veterinary Science of the University of Pretoria in the collection of samples for a leptospirosis survey. To date, 3,378 serum samples have been collected from non-vaccinated cattle herds, frozen and despatched to the faculty.

Investigations have also been undertaken into the apparent increase of infectious bronchitis in broilers. Various bacterial pathogens have been isolated, but no pattern could be established. Virus isolations were successful and the isolates are being typed overseas.

Trials have commenced on antibody levels to Gumboro disease in breeding hens following vaccination of the hens with the inactivated oil emulsion vaccine just before laying. As an aid to determine the criteria for revaccination, investigations into the variations of the levels of immunity between groups have been undertaken.

Investigations into BHC residues in mutton were continued and completed by Allerton RVL in December 1987. A total of 262 kidney fat samples were analysed which represented 4,228 individual sheep. These samples represented 18% of the sheep which came from areas where BHC had been used and which were slaughtered at Cato Ridge abattoir.

In total, 422 analyses on combined samples were carried out, of which 400 had less than 1 ppm BHC, 10 had between 1 and 10 ppm and 12 came from the original shipment of contaminated sheep. Confirmatory tests showed that the gamma-BHC concentration was less than the permissible upper limit of 2 ppm. The survey proved that the meat of sheep originating from areas where BHC had been used previously was not dangerous to human health.

Wethers which had been implanted with the half dose of bovine growth stimulants comprising 100mg progesterone and 10 mg oestradiol and which had been grazing on mixed ryegrass and clover, presented with rectal prolapses and retroversion of the bladder. Over a 3-month period, 14 cases occurred among 200 lambs. Post-mortem examinations showed the penis to be underdeveloped and the bulbo-urethral glands to
be grossly enlarged. Bladder distention had led to straining with resulting rectal prolapse. The combined oestrogenic effect of the growth stimulant and the clover grazing probably led to the development of the condition.

Atrophic rhinitis in pigs was confirmed for the first time in the Republic by Allerton RVL. Samples of nose septa and turbinate bones taken from pigs slaughtered at Estcourt and which had typical atrophic symptoms, yielded *Bordetella bronchiseptica* and *Pasteurella multocida*. Clinically noticeable were drastic displacement of the nasal bones and inferior growth rate in the infected animals. The condition was especially evident just after weaning and had a marked effect on production. Seven farms in the Natal Midlands reported cases of the disease. The incidence of the disease has since tapered off.

Suspected cases of mulberry heart disease were also investigated by Allerton RVL. About 20 pigs died about 2 weeks after weaning and the most noticeable post-mortem lesions were severe myocardial haemorrhages with lung oedema and fibrinous hydrothorax. Deaths stopped when the vitamin E level in the rations was doubled.

Middelburg Cape Regional Veterinary Laboratory tested the effectiveness of activated charcoal as a preventive against “vermeersiekte” in goats and found that 1 g/kg of charcoal together with a “vermeerbos” diet did not prevent “vermeersiekte”.

Grahamstown Veterinary Laboratory researched the incidence of coccidiosis in small stock in the area. From post-mortem results and following questionnaires sent to the local farmers, it became obvious that this disease is one of the most important in small stock in that area. *Fimeria ninekohlyakimovae* was the most common species (33 %), followed by *E. arloingi* (23 %), *E. hirci* (13 %) and *F. parva* (16 %).

Bluetongue vaccine trials carried out by Middelburg Cape RVL on 170 sheep showed that all 5 groups of bluetongue vaccine were safe for use.

After two outbreaks of “geeldikkop” it was possible to reproduce artificially 1 case only. This sick lamb had clinical symptoms and a raised gamma-GT level 7 days after the beginning of the “duwweltjie” trial.

The first leg of the haemoglobin typing survey of Merino stud animals at Grootfontein College of Agriculture was carried out. It is well known that AA-types haemoglobin have more resistance against haemolysis than AB and BB-types and animals with the AA type do not easily develop photosensitisation. Hereditary profiles will be followed over the next few years to determine if resistance to “geeldikkop” can be selected or not.

Middelburg Cape Regional Veterinary Laboratory also carried out analyses of blood and serum to establish normal values in blood and enzyme levels in 3-to-6-month-old Angora goats, to act as a guide in the diagnosis of the various disease conditions.

Stellenbosch RVL investigated the condition known as “bowie” in young sheep. The condition was apparent in fast-growing lambs of between 3 and 7 months of age, particularly on lush legume grazing. Bending of the distal growth plate of the radius took place because the animal’s mass increased at a faster rate than the bones mineralised. Preliminary findings indicated that the incidence of this disease could be reduced by encouraging a slower rate of growth during the danger periods, and an improved calcium:phosphate balance by feeding more roughage. Trace element supplementation could also be of value.

Circumstantial evidence indicates that the almost exclusive intake of “turknael” (*Erodium moschatum*) by sheep causes photosensitivity. This condition occurs widely in the Western Cape, particularly where grasses are being suppressed by selective herbicides that can lead to pure stands of “turknael”.

Air-sac infections in slaughter ostriches led to approximately 8 % of the ostrich carcases being condemned at the abattoir in Oudtshoorn. After bacteriological investigations by Stellenbosch RVL, it was established that a variety of different bacteria
and fungi were involved and that the inhalation of dust and other forms of materials could be the primary cause of this condition.

**RESEARCH ON GAME AND GAME DISEASES**

The State veterinarian at Skukuza has initiated several research projects concerning the epidemiology of foot-and-mouth disease.

In one project adult buffalo cows were caught and fitted with radio transmitters to monitor their movements, so that young animals could be caught regularly and sampled to find and identify prevalent strains of foot-and-mouth disease virus. Viral specimens from 8 young buffalo have already been collected.

Because of the fact that clinical foot-and-mouth disease is usually found in impalas in the Kruger National Park, extensive research on the epidemiology of the disease in impalas has been carried out. Samples are collected during game culling, game capture and during routine foot-and-mouth inspections. The following results have already been obtained:

1. The incubation period of foot-and-mouth disease in impalas after upper-respiratory-tract infection is 3 to 5 days.
2. There is a great variation in the pathogenicity of substrains of SAT I and SAT 2.
3. Impalas develop a mild viraemia \((10^7\text{ cell culture infective doses/mi})\) after infection, but shedding of the virus is low in comparison with bovines and buffaloes.
4. Antibody levels remain high for at least 6 months.

In another project warthogs were infected with the foot-and-mouth virus to determine if they shed as much virus as domestic pigs. Results from these trials are as follows:

1. Warthogs are highly susceptible to foot-and-mouth disease. The incubation period is 2 to 4 days.
2. Typical lesions are obtained and some warthogs died as a result of a myocarditis.
3. Warthogs develop a moderate viraemia and a fair number of virus particles were found in the lesions \((10^7\text{ cell culture infective doses/g})\). Few virus particles are, however, actually expelled via the respiratory system.

Research on buffalo disease \((Theileria parva lawrencei)\) infection was also undertaken. *Rhipicephalus zambesiense* nymphs which had parasitised these buffaloes were transferred to a bovine. The bovine developed classical buffalo-disease symptoms. As reported in the previous annual report, serological tests on these buffaloes did not demonstrate the presence of piro-antigen antibodies. Further research in this regard is necessary.

A naturally infected Jersey cow was also used to infect another bovine. One litre of her blood was injected into another bovine before she was treated with Buparvaquone. The recipient animal had a temperature reaction after 5 days and after 7 days schizonts were identified in the lymph node aspirants and “buffycoat” smears. After 21 days small pirospores were observed in blood smears.

The effect of equine influenza on zebras was also tested. These animals developed only slight symptoms and high antibody titres.

During research on the incidence of anthrax in the Kruger National Park, the state veterinarian at Skukuza found that the minimum infective dose for impalas \(\text{per os}\) was 15 million spores but parenterally as low as 500 spores.

A research project on bovine malignant catarrh was initiated together with officials from Nature Conservation and the Veterinary Research Institute at Onderstepoort. One-hundred-and-two blue wildebeest were caught in the central and southern parts of the park and sampled. All the animals had high antibody titres, but virus could only be obtained from calves younger than 6 months of age. Virus shedding fell off drastically the
older the calves were. At 2 months of age 61% of the calves shed virus, at 5 months of age 16.6%, but no virus shedding was found in the older calves.

Research on African swine fever continued. Serological tests on warthogs and domestic pigs were carried out and warthog burrows were examined for tampans. One-hundred-and-sixteen warthog burrows were found (53 active) and in 12 burrows from 3 farms in the Warmbaths district, tampans were found. Only one of these tampans yielded virus.

Of 29 serum samples from warthogs and 10 samples from domestic pigs, only 10 warthog samples tested positive.

KwaNdebele also continued with the tampan survey and 16 warthog burrows on 5 farms were examined. Tampans were found at only one locality and these tested negative for African swine fever virus.

Officials of the Lebowa State Service initiated a project to establish the possibility of propagating rare wildlife species by means of embryo transplants. During the year, preliminary work was done in respect of the capture and immobilisation of various game species.

Natal Region initiated an extensive survey to determine insecticide residues in wild animals and birds. The following organisations were involved: Natal Parks Board, Durban Museum, University of Natal and Allerton RVL. Eighty samples have been received so far but, because of the sophisticated apparatus needed for this determination, all results are not yet available.

**DISEASE CONTROL**

**CONTROLLED DISEASES**

Foot-and-mouth disease

No outbreaks of foot-and-mouth disease occurred in the Republic and only 4 buffalo carcases were condemned in the Kruger National Park because of suspect lesions.

All regions experienced a problem with regard to stray animals entering the regions as a result of border fence breaks caused by big game species or because of intentional border fence breakages caused by illegal immigrants. The heavy rains affected the Botswana-RSA border fence very severely and patrolling of this fence and borders was made difficult as a result. Table I reflects the figures.

**TABLE 1. Stray animals from neighbouring states**

<table>
<thead>
<tr>
<th>State</th>
<th>Destroyed</th>
<th>Traced back</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex Botswana</td>
<td>7 cattle, 1 goat, 6 elephants</td>
<td>20 cattle, 129 goats</td>
</tr>
<tr>
<td>Ex Zimbabwe</td>
<td>7 goats, 1 klipspringer</td>
<td>13 cattle</td>
</tr>
<tr>
<td>Ex Mozambique</td>
<td></td>
<td>36 cattle</td>
</tr>
<tr>
<td>Ex venda</td>
<td>3 buffalo</td>
<td>21 cattle, 17 goats</td>
</tr>
</tbody>
</table>

Terrorism remains a problem with border patrols and in this regard various officials were equipped with mine-resistant vehicles and Marnet radios so that direct contact with the Defence Force could be made.

Stock smuggling from neighbouring countries to the Republic also increased alarmingly. The help of the Stock Theft Unit of the South African Police was called on in
Natal following the meeting attended by the Directorate of Veterinary Services, KwaZulu Division of Veterinary Services, the SAP, the Defence Force and KwaZulu Conservation.

Various people were arrested and charged with illegal smuggling of cattle. In two cases involving 60 and 20 cattle respectively, the culprits were sentenced to 2 years imprisonment.

Renamo soldiers cut the Natal-Mozambique border fence on 14 occasions and 141 cattle were driven through the two fences. Each incident was reported to the Defence Force. The electrification of part of this fence was of great assistance in reducing the number of illegal movements.

The smuggling of stock from Botswana to the Republic also caused problems, particularly as a result of the large areas that must be patrolled by the border patrols, and the low fence. The Molopo River, which flowed strongly for the first time in 8 years on four occasions, also damaged the border fence and beacons between Dalyspan and Paddon. The construction of an inspection road next to the fence which was to be erected in the middle of the river bed was also terminated.

Various incidents of stock theft by Zimbabwean citizens from farms in Venda and from the Republic took place. A large percentage of these animals either returned of their own accord or were confiscated and returned by the Zimbabwean police and then to the owners concerned after a quarantine period.

The Transvaal Region also carried out trials on foot-and-mouth disease vaccine to test the various concentrations of saponins. Fifty cattle at Zonderwater and 20 at Zoutpan were involved in the trials. Results are still awaited.

Routine immunisations carried out are given in Table 2.

**TABLE 2. Routine immunisations**

<table>
<thead>
<tr>
<th>Region</th>
<th>Cattle</th>
<th>Small stock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transvaal</td>
<td>2 753</td>
<td>5 302</td>
</tr>
<tr>
<td>N. and E. Transvaal</td>
<td>63858</td>
<td>10394</td>
</tr>
<tr>
<td>Lebowa</td>
<td>25488</td>
<td>2025</td>
</tr>
<tr>
<td>KaNgwane</td>
<td>139 476</td>
<td>20372</td>
</tr>
<tr>
<td>KwaZulu</td>
<td>63 554</td>
<td>7 688</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>295129</td>
<td>45781</td>
</tr>
</tbody>
</table>

Rabies

Northern and Eastern Transvaal and Natal in particular experienced marked increases in the incidence of rabies. In the Northern Transvaal a four-fold increase in cases of rabies in jackals and a two-fold increase in cattle was noted.

Dogs were responsible for the majority of cases (89 %) in Natal. This region also reported an 87 % increase in the total number of positive cases compared to last year.

Table 3 shows the incidence and trends in comparison to the previous year and the species distribution of positive cases.

**TABLE 3. Rabies incidence and tendencies per region**

<table>
<thead>
<tr>
<th>Region</th>
<th>Samples submitted</th>
<th>Samples positive</th>
<th>% positive</th>
<th>% change vs. 1987</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transvaal</td>
<td>244 (294)</td>
<td>29 (55)</td>
<td>11,9</td>
<td>47 (down)</td>
</tr>
<tr>
<td>N. and E. Transvaal</td>
<td>178 (116)</td>
<td>82 (46)</td>
<td>46,1</td>
<td>78 (up)</td>
</tr>
<tr>
<td>Higbved</td>
<td>309 (327)</td>
<td>98 (113)</td>
<td>31,7</td>
<td>13 (down)</td>
</tr>
<tr>
<td>OFS</td>
<td>216 (205)</td>
<td>76 (92)</td>
<td>35,2</td>
<td>21 (down)</td>
</tr>
<tr>
<td>Natal</td>
<td>661 (306)</td>
<td>189 (101)</td>
<td>28,6</td>
<td>87 (up)</td>
</tr>
<tr>
<td>Eastern Cape and Karoo</td>
<td>143 (147)</td>
<td>41 (39)</td>
<td>28,7</td>
<td>5 (down)</td>
</tr>
<tr>
<td>Western Cape</td>
<td>47 (41)</td>
<td>12 (17)</td>
<td>25,5</td>
<td>42 (down)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1 798 (1 436)</td>
<td>527 (463)</td>
<td>29,7</td>
<td>25 (up)</td>
</tr>
</tbody>
</table>
The total number of official vaccinations carried out increased slightly - from 393 441 last year to 397 926 this year. This was mainly attributed to a 57 % increase in cattle vaccinations.

Official cattle vaccinations in the Soutpansberg (north of the berg) and Messina districts were initiated during the year as a trial which will continue for the next 5 years.

The Highveld, Free State and Eastern Cape and Karoo Regions were actively involved in the control of meercats in areas where positive cases had occurred regularly. About 2 114 meercat burrows or colonies were treated with cyanide gas.

Table 4 indicates control measures in respect of vaccinations carried out in each region.

A Rabies Diagnostic Unit was put into operation at Allerton RVL. This unit will serve the entire Natal and KwaZulu Regions.

A new committee that will play a co-ordinating role in rabies control was brought into being. This committee consists of representatives of Veterinary Services, Natal (2 members), Veterinary Services of KwaZulu (2 members) and the South African Veterinary Association who will represent the private practitioners (2 members). The first meeting of this committee took place at Allerton RVL on 1988/03/04. Guidelines in respect of control measures to control rabies were formulated at this meeting.

**Anthrax**

Three confirmed outbreaks of anthrax occurred in the Republic during the year under review. In one outbreak, 17 out of 240 cattle in the Viljoenskroon area died and in two other outbreaks, 1 / 18 cattle (Kimberley) and 1/22 sheep died (Ladismith, Cape).

What is perturbing, however, is the fact that only 993 685 vaccinations were carried out compared to 3 499 460 last year. This can be ascribed to the Ministerial Directive that stock inspection personnel must no longer visit farms for the express purpose of immunising animals. Notwithstanding the fact that all cattle owners are compelled by law to immunise their cattle, less than 600 000 cattle were actually vaccinated by the owners. This represents 7,5 % of the cattle population of the entire country.

**East coast fever**

No cases of *Theileria parva parva* infections were reported during the year under review.

**Corridor disease**

Only one outbreak of *Theileria parva lais'rencei* occurred following a buffalo wandering on to a farm in the Phalaborwa district. Eight cattle displayed clinical symptoms and 7 died. One bovine was moved to Skukuza for tests. A 5:5:4 day dip programme was instituted on the infected farm.

**Bovine tuberculosis**

There was a slight decrease in the total number of tuberculin tests carried out in the Republic when compared with the number in the previous year. This year 1 897 759 tests were carried out compared to 1 931 444 last year, a decrease of 1,74%. This situation could possibly be attributed to the fact that private practitioners were not geared to doing the increased number of tests required as a result of the privatisation efforts, and the fact that many farmers were unwilling to test because they now had to pay for the tests themselves. The delay in the implementation of the “milk is milk” scheme also contributed
to this state of affairs.

The biggest change that occurred was in the proportion of herds belonging to the various schemes. Table 5 indicates these changes.

**TABLE 4. Rabies vaccinations per region (figures in brackets are for i986/87)**

<table>
<thead>
<tr>
<th>Region</th>
<th>Dogs</th>
<th>Cats</th>
<th>Cattle</th>
<th>Small stock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transvaal</td>
<td>14901 (18478)</td>
<td>1316 (1816)</td>
<td>830 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>N. and E. Transvaal</td>
<td>44859 (44360)</td>
<td>1 971 (1 720)</td>
<td>23778 (16013)</td>
<td>1 446 (0)</td>
</tr>
<tr>
<td>Highveld</td>
<td>55 254 (56 809)</td>
<td>9604 (11 224)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>OFS</td>
<td>23 592 (52 869)</td>
<td>4473 (7237)</td>
<td>1 0 (467)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Natal</td>
<td>169019(139918)</td>
<td>20233(16978)</td>
<td>1219 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>E. Cape and Karoo</td>
<td>15283 (10 324)</td>
<td>4973 (3071)</td>
<td>106 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Western Cape</td>
<td>3 646 (10049)</td>
<td>1 407 (2108)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Total</td>
<td>326554(332 807)</td>
<td>43977 (44 154)</td>
<td>25933 (16 480)</td>
<td>1 446 (0)</td>
</tr>
<tr>
<td>Grand total</td>
<td>397 910 (393 441)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TABLE 5. Herds participating in schemes**

<table>
<thead>
<tr>
<th>Scheme</th>
<th>No. herds</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accreditation</td>
<td>1 418</td>
<td>1 888</td>
</tr>
<tr>
<td>Annual</td>
<td>3 865</td>
<td>7 452</td>
</tr>
<tr>
<td>Diagnostic</td>
<td>10073</td>
<td>8 044</td>
</tr>
</tbody>
</table>

The status of many herds changed from the Accreditation Scheme and the Herd Diagnostic Scheme to the Annual Diagnostic Scheme. This state of affairs developed firstly because of the large-scale privatisation of the schemes and secondly because of the stricter application of conditions required in the accredited herds.

The incidence of positive reactors expressed as a percentage of the total number of tests carried out, increased from 0,048 % last year to 0,11 % this year. Of all herds tested, 2,22 % were declared infected, which represents a decided increase over the 0,78 % of last year. More infected animals were therefore traced and the total number of infected herds increased to 374 herds (76 267 cattle), an increase of 12 % in herds and 8 % in cattle over the previous year.

Various mini-campaigns were initiated in the regions with the intention of tracing new infections.

In the Transvaal Region for instance, 10 districts with 1 281 herds comprising 149 857 cattle were tested at a cost of 49 c per animal. In the Highveld Region 75 258 cattle were tested in 3 districts at a cost of 60 c/animal. The Vryburg, Postmasburg and Gordonia districts in the Free State Region were also tested. During these campaigns 199 herds representing 38 958 cattle, were tested at R 1,76 per bovine (which included CA tests and CA vaccine). The mini-campaigns initiated by the State veterinarian at Port Elizabeth resulted in a cost of R1,43 per animal after 557 herds (8 589 cattle) were tested. This cost again included CA tests and vaccination.

With the changing activity of the stock inspection personnel, tuberculosis testing gained a higher priority. Sixty stock inspectors were successfully trained during two intensive tuberculosis courses. At present 255 stock inspectors representing nearly 75 % of all stock inspectors in service are qualified to perform tuberculosis testing.

During the year under review 1 900 reactors and contact animals were slaughtered throughout the country, compared with 853 last year. Forty per cent of these animals displayed lesions, either local or general. Owners received R1 672 408 in compensation,
or an average of R880 per animal. These animals realised R1 270 435 that went into the State coffers. This represents a loss of R401 973. Remuneration paid to private veterinarians under contract came to R423 828, a substantial drop from last year’s R985 773.

A total of 76 herds were tested in KaNgwane which involved 1 972 tests, all with negative results. Officials of KwaNdebele tested 8 herds (406 cattle). Two positive animals were identified. The tuberculosis scheme is not applied in Lebowa but the State stud is tested regularly. Six-hundred-and-thirty-four cattle tested negative during the year.

**Bovine brucellosis**

The number of tests carried out under the Brucellosis Scheme increased from 1,39 million in 1986/87 to 1,49 million this year. There was a slight decrease in the percentage positive reactors (1,54 % this year compared to 1,55 % last year).

Table 6 gives an indication of the incidence of bovine brucellosis in the regions.

**TABLE 6. Incidence of bovine brucellosis**

<table>
<thead>
<tr>
<th>Region</th>
<th>% pos. herd tests!</th>
<th>% pos. tests!</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>total herd tests</td>
<td>total tests</td>
</tr>
<tr>
<td>Transvaal</td>
<td>31</td>
<td>1,86</td>
</tr>
<tr>
<td>N. and F. Transvaal</td>
<td>27</td>
<td>1,50</td>
</tr>
<tr>
<td>Highveld</td>
<td>32</td>
<td>2,32</td>
</tr>
<tr>
<td>OFS</td>
<td>22</td>
<td>1,37</td>
</tr>
<tr>
<td>Natal</td>
<td>14</td>
<td>0,81</td>
</tr>
<tr>
<td>Eastern Cape and Karoo</td>
<td>8</td>
<td>0,40</td>
</tr>
<tr>
<td>Western Cape</td>
<td>12</td>
<td>1,08</td>
</tr>
<tr>
<td>Average</td>
<td>23</td>
<td>1,54</td>
</tr>
</tbody>
</table>

The average percentage positive herd tests compared to the total herd tests decreased from 24,9% last year to 23,1 % this year.

Official vaccinations of heifers by the State with Strain 19 vaccine fell off drastically from 430 946 last year to 212 222 this year. 542 547 Doses were issued this year compared to 394 851 last year. Only 870 adult cows in 14 herds were immunised by officials of the Division. Adult vaccination was confined to exceptional cases involving very high infection rates.

Only 156 accreditation certificates were issued this year compared to the 204 of last year. The total number of animals in the accredited herds consequently declined from 29 528 to 18 576 this year. Of the above-mentioned accredited herds, 22 herds comprising 4 058 animals maintained their accreditation status on the basis of negative milk-ring tests.

A total of 3 464 herds (250 602 cattle) tested negative using serology under the annual diagnostic scheme, whereas 602 herds were declared negative under this scheme using the milk-ring test (62 610 cattle).

A total of 4 222 herds comprising 331 788 cattle can therefore be regarded as free of brucellosis.

The privatisation effort with regard to this scheme also progressed favourably. The Transvaal Region has privatised 1 065 herds to date. Private practitioners in this Region bled 1 424 herds which represented 160 334 animals, compared to 2065 Herds (193 882 cattle) bled by officials. One-hundred-and-twenty-five herds (13 702 animals) were bled by the owners themselves. In the Highveld Region, contracted private
veterinarians bled 111 467 animals. An amount of R40 819 was paid to private practitioners for services rendered in this region.

Eight herd tests were carried out in KwaNdebele (406 animals) which revealed two positive reactors. During two mini-campaigns, 5 218 heifers were also vaccinated by officials. The Division of Veterinary Services of Lebowa tested 1166 blood samples of which 11 were positive, and 40 403 heifers were vaccinated. Officials of the KaNgwane Veterinary Services vaccinated 5 721 heifers and 1 017 cattle from 64 herds were tested. Eight positive animals were found in 6 herds.

Table 7 reflects the laboratory tests carried out by the various laboratories in the regions.

**Nagana**

No cases of *Trypanosoma brucei, T. congolense* or *T. vivax* occurred in the Republic.

**Dourine**

Twenty cases of *Trypanosoma equiperdum* occurred in horses in the Republic. Eighteen of these animals were destroyed, one was sent to Onderstepoort for research and the remaining animal was still in isolation at the time of this report.

A total of 3 821 serum samples were tested using the complement fixation test of which 33 originally tested as suspect but later tested negative.

**Sheep scab**

A slight increase of 4 % in the number of outbreaks of sheep scab was reported. In total, 191 outbreaks were reported which comprised about 23 570 clinical cases.

A total of 509 770 sheep were treated with ivermectin or dipped as control measures.

Eighteen prosecutions with respect to sheep scab were instituted. Judgement in 11 of these cases has not yet been handed down, in four cases the parties involved were found guilty and in three instances the State lost its case.

The Transvaal Region carried out a mini-campaign in the Standerton district where 362 097 inspections were conducted at a total cost of R4 769,93.

The Free State Region had mini-campaigns in the Brandfort and Gordonia districts at which time 345 575 and 190 789 inspections respectively were carried out at a total
cost of RIO 503.00.

**African swine fever**

No cases occurred in the Republic. Permit control was strictly applied in the controlled areas but illegal transport, particularly with warthog carcases, still occurred. One person who was transporting pigs without a permit in the Swartruggens district, was prosecuted and fined R100.00.

There are 10 approved units (4379 pigs) in the Transvaal Region and 68 units in the Northern and Eastern Transvaal Region, representing 60,582 pigs. In Lebowa there are 15 approved units with 1183 pigs.

(Note: For information regarding swine fever survey see the heading *Diverse and Applied Research*.)

**Swine erysipelas**

Various outbreaks of this disease in pigs were diagnosed, mostly at abattoirs. Seventy-four outbreaks representing 197 cases were diagnosed in the Republic. Most cases occurred in the intensive pig-producing areas. Transvaal Region reported 107 cases and the Western Cape 38 cases.

**Newcastle disease**

Four outbreaks occurred in imported finches at the quarantine station at Jan Smuts airport. The lentogenic strain caused the death of 839/1 792 of these birds which came from the East and Belgium.

One outbreak in the Northern and Eastern Transvaal Region led to the death of 1200/10000 birds. A similar situation in the Free State Region led to the death of 1000/3000 birds.

Fifty-three outbreaks of lentogenic Newcastle disease were diagnosed by the Poultry Section at Onderstepoort, and one suspect case of velogenic Newcastle disease.

**Psittacosis**

Natal Region reported that this disease occurred fairly widely in psittacines in the Region. Eleven outbreaks, with an unknown number of birds involved, were reported.

Two outbreaks occurred at the quarantine station at Jan Smuts Airport where 15/80 deaths occurred amongst cockatoos from Singapore and 42/46 doves from Thailand died. Three cases were diagnosed at the Onderstepoort Poultry Section.

**Scrapie**

No cases occurred. Various farms where sheep have been imported are still under quarantine.

**Bovine malignant catarrh (snotsiekte)**

Thirty-nine confirmed and 4 unconfirmed outbreaks of this disease occurred. In 29 outbreaks there had been contact with wildebeest whereas in 10 outbreaks no contact with wildebeest could be confirmed.

Seventy-five bovines died as a result of BMC. Transvaal Region reported deaths in 14/427 bovines which were suspected of having snotsiekte in 4 outbreaks.
Eastern Cape and Karoo Region reported a case where 3 wildebeest from Carnarvon Game Reserve were taken to 2 farms in the district. All 3 of these animals tested positively and one owner immediately returned the animal involved to the game reserve.

In a project in the Thabazimbi district it would appear that animals having direct contact with wildebeest apparently become infected during July to October and then die during September to November. Where there has been no contact with wildebeest, most deaths occur during the period March to April.

Contagious equine metritis

A total of 1 383 specimens were tested from imported horses. All tests were negative.

Equine influenza

The occurrence of equine ‘flu’ declined dramatically during the past year. During the previous report year 564 reported outbreaks with 8 068 cases were reported as against 237 outbreaks with 2 173 cases during the present year. Reported cases of this disease in regions are given in Table 8.

<table>
<thead>
<tr>
<th>Table 8. Reported occurrence of equine influenza</th>
</tr>
</thead>
<tbody>
<tr>
<td>Region</td>
</tr>
<tr>
<td>Transvaal</td>
</tr>
<tr>
<td>N. and E. Transvaal</td>
</tr>
<tr>
<td>Higbveid</td>
</tr>
<tr>
<td>OFS</td>
</tr>
<tr>
<td>Natal</td>
</tr>
<tr>
<td>Eastern Cape and Karoo</td>
</tr>
<tr>
<td>western Cape</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Good co-operation was obtained from organisers at meetings. In many cases stricter requirements for vaccinations had been set out and tight control on animals arriving at the meeting had been applied.

NON-CONTROLLED DISEASES

BACTERIAL DISEASES

Mastitis

This disease is responsible for heavy losses in the milk industry. The outbreaks that are usually reported and with which staff are associated, are mainly cases of acute mastitis. The subclinical form, that may produce up to 5 % loss in production, is in many instances undetected.

The above was an important reason for the initiation of the mastitis control schemes at various laboratories of this Directorate.

A total of 727 outbreaks of mastitis affecting 4 775 cows, of which 7 died, has been brought to the attention of our personnel.

The mastitis scheme has been fully privatised at the Stellenbosch Regional Laboratory so that the laboratory is no longer directly involved.

In Natal, RVL Allerton had 165 herds involved in the scheme (VL Vryheid 12 herds) and 53 724 somatic cell counts were performed (VL Vryheid 3 962). Partial
computerisation of the scheme at Allerton simplified the administration considerably.

VL Bloemfontein expanded their scheme to 79 herds with 3 523 cattle involved; 37 833 samples were examined and it has been found that the percentage of infected cows was reduced from 16.4 in 1986/87 to 15.4 in the year under review. They attributed this reduction to the fact that farmers are culling chronically infected cattle sooner, and to the use of dry cow intramammary treatment.

VL Potchefstroom evaluated milk samples from 78 herds with 4 548 cows involved. At VL Kroonstad 52 problem herds were examined. In the Highveld Region a total of 26 672 somatic cell counts were performed.

RVL Middelburg (Cape) performed 26 246 somatic cell counts of which 32 % were higher than 0.5 million cells/ml in the 81 dairy herds involved in their mastitis control scheme.

Countrywide, nearly 30 000 bacterial cultures were done and it would appear that Staph viococcus aureus is still by far the most common pathogen involved in mastitis. Nearly 50 % of all pathogens isolated from milk samples was S. aureus and 16 % S. epidermidis.

The veterinary laboratory at Bloemfontein isolated the bacterium Nocardia asteroides, that can cause a granulomatous mastitis, from 2 milk samples.

Pulpy kidney disease

A number of outbreaks, resulting in 2437 mortalities, were reported countrywide. Middelburg (Cape) RVL performed a survey after an apparent increased incidence of the disease was found in animals that had been vaccinated. It was found that as much as 20 % of lambs did not immunise properly in spite of meticulously following Onderstepoort’s vaccination recommendations.

Regular immunisation of adult animals and the judicious use of the oil-based vaccine did lead to the development and maintenance of a good immunity.

The Western Cape Region reported the sale of about 2.5 million doses of vaccine through co-operatives in the Region (sheep population ± 4.2 million).

Quarter evil (Clostridium chauvoei)

Mortality due to this disease has been recorded in all regions and it affected cattle, goats and sheep.

Countrywide, 137 outbreaks with 525 mortalities were reported, mostly amongst cattle. The Natal Region had the highest incidence with 87 outbreaks and 280 mortalities.

In the Western Cape Region, 3 outbreaks with 8 mortalities out of 3414 animals, were recorded.

Officers assisted farmers with the inoculation of 24 835 animals in the Northern and Eastern Transvaal, Transvaal, Highveld and Free State Regions.

KwaNdebele reported 4 mortalities in 2 outbreaks and their officers assisted with the inoculation of 174 cattle in 3 herds.

In Lebowa 215 314 cattle were inoculated. No outbreaks occurred there.

From KaNgwane, where 24508 cattle were inoculated, no mortalities have been reported.

Uterine quarter evil

The Eastern Cape and Karoo Region reported that this condition occurred sporadically. Nine outbreaks with 52/2 617 mortalities occurred in various districts.

Clostridium septicuin

Transvaal Region reported 2 outbreaks during which 2/205 cattle died. Northern and Eastern Transvaal
reported 4 outbreaks, with 2 cattle, 11 sheep and 2
Boer goats that died.
    Highveld Region reported a single death - a bull.

*Clostridiun oedematiens*

Ten outbreaks, with 24 mortalities, were reported in sheep and 16 outbreaks, with 34 mortalities, in cattle. Most cases have occurred in Natal (28 outbreaks with 19 deaths).

**Botulism**

More than 50 outbreaks occurred countrywide with 159 cattle, 710 sheep, 5 horses and 1 ostrich that died of botulism.

In the Iipington district, 65/2 000 sheep died after consuming purchased, contaminated, bone meal. A dead jackal found in a drinking trough, was responsible for 150/800 mortalities in the same district.

The State veterinarian at Calvinia reported 437 sheep mortalities.

Officers assisted farmers with the inoculation of stock as follows:
    Transvaal - 3 139 cattle
    Northern and Eastern Transvaal - 3 168 cattle
    Highveld - 2276 cattle
    Free State - 940 cattle

In the Western Cape 374 147 doses vaccine were sold through co-operatives.

In the Highveld Region 19 847 inoculations were reported in the previous report year. All regions experienced a drastic reduction in inoculations compared to last year.

Of the self-governing states, only KwaNdebele reported 1 case of botulism. Lebowa reported 3 199 inoculations (cattle) and KaNgwane 575.

**Tetanus**

The use of elastic rings for tail docking in lambs again gave rise to widespread outbreaks of tetanus with resultant mortalities.

Countrywide, 1 097 mortalities in lambs were reported with the vast majority in the Western Cape:
    SV Malmesbury 638 deaths, SV Swellendam 300 deaths.

**Lamb dysentery**

Eastern Cape and Karoo Region reported 3 outbreaks in kids (27/440 died) and 1 outbreak in lambs (10/56 died) in the districts of East London, Middelburg and Cradock.

**Red gut**

Two outbreaks in kids and lambs occurred in the Middelburg (Cape) district with 16 out of 837 dying.

Western Cape reported 150 mortalities in lambs in the George and Swellendam SV areas, and vaccine sales totalling 20 000 through co-operatives in the region.

**Corynebacteriasis**

These are widespread and common diseases that are not normally reported.

The condition is usually associated with management practices such as tail docking and environmental factors such as “steekgras” and heavy tick infestations. Outbreaks therefore occur fairly seasonally.

*Corynebacterium pyogenes* caused abortion in cattle in the Northern Transvaal during late summer and autumn. The organism was isolated from 9 aborted foetuses. Cases of metritis also occurred.

Three young elephants were also treated in the Kruger National Park for abscessation.

Transvaal Region reported that udder abscessation in dairy cows occurred
frequently. Often no distinction is made between *C. pvogenes* and *C. pseudo tuberculosis* (*C. ovis*). In general *C. pvogenes* occurs more frequently in cattle and *C. pseudotuberculosis* causes a more generalised lymph-node abscessation in sheep.

Free State Region reported 91 outbreaks with 427 cases. One-hundred-and-nine sheep, 6 cattle and 7 Boer goats died as a result of this condition.

Countrywide, 186 outbreaks were reported with 978 cases amongst cattle, goats and sheep.

*C. pi'ogenes* has also been isolated from the cervix of a mare and *C. pseudotuberculosis* from cases of brain and pituitary abscessation in 8 Boer goats in the Northern Transvaal.

Eastern Cape and Karoo Region reports the isolation of *C. pseudotuberculosis* from an outbreak in goats in the Bathurst district (2/1 000 cases), and *C. equi* from a sheep in the Middelburg district.
Bolo disease

Natal Region reported 1 outbreak of this disease with 5 sheep affected.

The Regional Veterinary Laboratory in Middelburg (Cape) conducted transmission experiments with *C. bovis* and is of the opinion that the disease can be artificially transmitted indoors. Environmental factors such as sunlight apparently play a major role in inhibiting the spread of the disease in the open.

In association with a private firm, a “bob dip” was tested. Transmission experiments will be repeated in the next year to try and explain the great variation in results obtained.

Pasteurellosis

Cases of primary pasteurellosis were not widespread and most isolations were from cases where *Pasteurella* spp. were responsible for secondary infections.

This disease is also associated with management practices. Northern and Eastern Transvaal Region reported, amongst others, 2 outbreaks with 21 mortalities, both among cattle in feedlots.

Eastern Cape and Karoo Region reported 755 cases in 25 outbreaks where both *Pasteurella haemolytica* and *P. multocida* were involved. Cattle, goats and sheep were affected by the outbreaks as were turkeys and Angora rabbits (43 cases in 3 outbreaks).

In Bloemfontein, 1 lechwe, 1 steenbok, 1 springbok and 1 nyala died in the zoo as a result of pasteurellosis. Free State Region reported 75 outbreaks with 960 cases and 821 mortalities.

Western Cape reported 400 mortalities and that 59 250 doses of vaccine were sold through co-operatives in the region.

From the Transvaal Region, 234/7 721 sheep mortalities, 43/10242 cattle mortalities and 38/331 Angora goat mortalities were reported.

Highveld Region reported 24 outbreaks in cattle, with 25 mortalities, and 30 outbreaks in sheep, with 42 mortalities. Officers in the region assisted farmers with the inoculation of 256 sheep and 1 436 cattle.

Blue udder

*Pasteurella* organisms are often involved in this condition. This disease is not often reported and only 145 cases have been recorded.

Colibacillosis

Northern and Eastern Transvaal Region reported the following mortalities: 29 goats, 15 sheep, 4 calves, 2 lambs and 2 Angora kids. One heifer also died as a result of septic metritis shortly after calving. Abortions in goats also occurred where *F. coli* was isolated.

Highveld Region reported 7 outbreaks with 56 cases, Free State Region 4 outbreaks in sheep with 28/882 cases and 6 outbreaks in cattle with 18/525 cases.

Eastern Cape and Karoo Region reported 25 outbreaks in cattle, sheep and goats with 121 cases and 2 outbreaks in rabbits, with 41 mortalities.

Western Cape Region reported 16 cattle mortalities and 20 sheep mortalities. The biggest problem in this region is, however, encountered with mortalities of young ostriches; 2 447 mortalities were brought to the attention of officers, but it is suspected that the numbers were much higher but were not all reported. The Regional Laboratory at Stellenbosch investigated the problem and provisional conclusions were that poor management and housing as well as poor hygiene were contributing factors to the
Leptospirosis

Clinical cases of this disease generally tend to be decreasing compared to the previous report year.

Blood samples were collected from animals involved in abortion storms. A significant number of animals were positive on serological testing in most of these cases.

In the Northern and Eastern Transvaal Region problems were encountered exclusively in cattle. From 17 herds where 328 blood samples were collected, 80 cattle tested positive and 12 suspicious. Leptospira tarassovi, L. pomona, L. copenhageni and L. mini were identified in the above-mentioned herds.

Natal Region also reported a high incidence in cattle with 23 outbreaks and 57 cases.

In the Transvaal Region, an outbreak occurred in goats, 26 blood samples were taken from a goat herd where abortions occurred. Twelve animals had high serological titres and 9 reacted suspiciously.

Leptospirosis in pigs was regularly diagnosed at abattoirs and Transvaal Region reported 24/150 pig kidney condemnations. An outbreak in the Western Cape Region occurred where 4 cows aborted and kidney lesions were seen in slaughter pigs at the abattoir.

The AI and Reproduction Section found the following with routine serological testing of bulls at the AI station:

<table>
<thead>
<tr>
<th>Region</th>
<th>Positive Cases</th>
<th>Negative Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transvaal</td>
<td>3</td>
<td>95</td>
</tr>
<tr>
<td>Donkerhoek</td>
<td>12</td>
<td>118</td>
</tr>
<tr>
<td>Natal</td>
<td>64</td>
<td></td>
</tr>
<tr>
<td>Boland</td>
<td>43</td>
<td></td>
</tr>
</tbody>
</table>

Pseudomonas infection

At the quarantine station at Jan Smuts Airport, the organism cultured 3 out of 146 imported parakeets and from swabs from the reproductive systems of 2 imported mares.

In the Soutpansberg district (Northern and Eastern Transvaal Region) 3 ewes died as a result of septic metritis caused by this organism.

Pneumonia and septicemia also occurred in sheep and goats in the Middelburg (Cape) district, and fleece rot in the Queenstown district. Brain abscessation in Saanen goats and eye abscesses in rabbits were also attributed to P. aeruginosa.

Actinobacillosis and actinomycosis

Wooden tongue and lumpy jaw occurred sporadically in all regions with the majority of cases caused by Actinobacillus lignieresi. Only 30 cases of actinobacillosis in sheep and cattle have been reported and 4 outbreaks of actinomycosis, with 14 cases, occurred (13 cattle died in Natal).

Actinomycosis has also been seen in kudus and impalas in the Kruger National Park.

Foot rot and foot abscess

Both conditions occurred at the end of the year under review as a result of the wet conditions after the heavy rain.

Few cases have been presented for diagnosis and assistance because private
veterinarians and farmers tend to treat the animals themselves. Countrywide, 251 cases of foot rot have been reported. In the Letaba district of the Northern and Eastern Transvaal Region 38 and 37 cattle were affected in 2 herds.

Foot abscess in sheep was common in the Transvaal, Highveld and Free State Regions during February and March 1988 and more than 1 500 cases have been reported during the year under review.

In the Western Cape *Bacteroides nodosus* is a major cause of lameness in sheep and the region reported 1 151 cases of foot rot.

**Listeriosis**

The Western Cape Region reported 15 cases of listeriosis in sheep, goats and pigs. *Listeria innocua* has been isolated from the lung of a pig slaughtered at the Port Elizabeth abattoir. This led to the detection of an outbreak during which 23/500 pigs died and another 35 were clinically affected.

**Conditions due to klebsiellae**

At the Jan Smuts quarantine station, *Klebsiella* species have been isolated from 16 horses imported from the United Kingdom and the United States of America. Various serotypes have been isolated from these horses namely 3: 6; 7; 19; 21: 23: 27; 31; 33: 52 and 64.

*K. pneumoniae* has been isolated from the brain of a 3-month-old calf showing nervous symptoms in the Northern and Eastern Transvaal Region. The organism has also been isolated from the lungs of a foal that died of a severe pneumonia in the Kimberley area and a sheep from the Potchefstroom area.

*K. ozoenae* has been cultured from uterine swabs taken from a mare in the Ceres district.

**Conditions due to *Staphylococcus aureus***

Various disease conditions such as mastitis and blue udder are caused by this organism, by itself, or in conjunction with other pathogens.

Cases of pyoderma in dogs have been reported in almost all regions. In many cases autogenous vaccine was prepared by the Veterinary Research Institute at Onderstepoort.

Both Transvaal Region and Eastern Cape and Karoo Region reported cases in Angora rabbits. This includes a case in the Transvaal in a rabbit imported from Spain.

Arthritis in chickens, pneumonia in a goat, and in cattle and an abscess in a bovine have also been attributed to this organism.

In the Eastern Cape and Karoo Region, 0 steenbok died due to a necrotic stomatitis caused by *Staph. aureus*.

**Strangles**

*Streptococcus equi* has been isolated from a nasal swab taken from a horse in the Middelburg (Cape) district that suffered from chronic nose bleeding. A clinical case also occurred in the Williston district of the Western Cape Region.

**Ophthalmia**

This condition occurred over a wide area especially in the drier months of the year. A vitamin A deficiency is in many cases a contributing factor. (Also see *Infectious ophthalmia.*
Haemophilus infection

In the Eastern Cape and Karoo Region this organism together with P. multocida and C. P. pvogenes has been isolated from a sheep with organism together with septicaemia.

Other bacterial diseases

Streptococcus spp. caused various conditions, as shown in Table 9.

Pediococcus pentosaceus has been isolated from a septic arthritis in a horse in the Transvaal Region. The pathogenicity of this organism is unknown.

Fusibacterium necrophorum gave rise to the death of 5/50 Boer goat kids (about 14 days old) in the Kuruman district. At post-mortem multiple areas of liver necrosis were seen.

TABLE 9. Conditions caused by various Streptococci

<table>
<thead>
<tr>
<th>Organism</th>
<th>Animal</th>
<th>Disease</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>St rep. Dysgalactiae</td>
<td>Lambs Mares</td>
<td>7/198 dead Abortion</td>
<td>Eastern Cape and Karoo</td>
</tr>
<tr>
<td>Strep. Zooepidemicus</td>
<td></td>
<td></td>
<td>Quarantine Station Jan Smuts (cx USA)</td>
</tr>
<tr>
<td>Strep. Equisimilis</td>
<td>Horses</td>
<td>Throat abscess</td>
<td>Quarantine Station Jan Smuts</td>
</tr>
<tr>
<td>Streptococcus spp.</td>
<td>Angoras</td>
<td>Spinal abscess</td>
<td>Eastern Cape and Karoo</td>
</tr>
<tr>
<td>Strep. Pyogenes</td>
<td>Piglets</td>
<td>Purulent arthritis</td>
<td>Eastern Cape and Karoo</td>
</tr>
<tr>
<td>Strep. Mobiliformus</td>
<td>Castrated Angoras</td>
<td>90/130 postitis</td>
<td>Eastern Cape and Karoo</td>
</tr>
<tr>
<td>Strep. Uberis</td>
<td>Sheep</td>
<td>Abscess</td>
<td>Eastern Cape and Karoo</td>
</tr>
<tr>
<td>Strep. Anginosus</td>
<td>Cattle</td>
<td>Lung and abdominal abscessation</td>
<td>Kroonstad</td>
</tr>
</tbody>
</table>

Staphylococcus epidermidis has been found in 2 cases of secondary bacterial infection in the Eastern Cape.

Histophilus ovis caused necrotic vulvitis in 20/115 sheep ewes in the Middelburg (Cape) area. (See Reproductive diseases.)

Branhamella cattarhalis together with Moraxella bovis has been isolated in 3 / 7 cases of ophthalmia in cattle in the Eastern Cape and Karoo Region.

Sheep and goat brucellosis

Using the complement fixation tests (CFT). the regional laboratory at Middelburg (Cape) tested sheep and goat serum samples and found 167 to be positive for Brucella ovis, 54 suspicious and 2 676 negative; in the case of B. abortus, 208 samples tested positive, 103 were suspicious and 2511 negative.

The Free State Region reported 4 outbreaks of arthritis in lambs in the Upington area where 50/ 800 lambs showed symptoms of arthritis. Arthritic fluid aspirated by needle was found to be slightly turbid and contained many neutrophil and mononuclear cells.

Fluorescent antibody tests for Chlamydia were negative and no bacterial growth could be obtained out of various specimens. The cause of the problem is still unknown.

Salmonella spp. infection remains an important cause of mortality in imported birds at the quarantine station at Jan Smuts airport. This organism is found in almost 90 % of consignments and especially parakeets and parrots are affected.
PROTOZOAL DISEASES

Babesiosis

Babesiosis in cattle occurred in Natal, Transvaal (Piet Retief area) and Northern Transvaal. Table 10 gives an indication of the distribution of cases.

TABLE 10. Distribution of babesiosis outbreaks

<table>
<thead>
<tr>
<th>Region</th>
<th>Outbreaks</th>
<th>Cases</th>
<th>Mortality</th>
<th>Highest incidence areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transvaal</td>
<td>148</td>
<td>512</td>
<td>339</td>
<td>Piet Retief</td>
</tr>
<tr>
<td>N and ETransvaal</td>
<td>?</td>
<td>268</td>
<td>156</td>
<td>White River</td>
</tr>
<tr>
<td>Highveld</td>
<td>17</td>
<td>18</td>
<td>7</td>
<td>?</td>
</tr>
<tr>
<td>OFS</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>?</td>
</tr>
<tr>
<td>Natal</td>
<td>393</td>
<td>1106</td>
<td>93</td>
<td>Postmasburg</td>
</tr>
<tr>
<td>Eastern Cape and Karoo</td>
<td>43</td>
<td>?</td>
<td></td>
<td>Richmond, Ixopo</td>
</tr>
<tr>
<td>Karoo</td>
<td></td>
<td></td>
<td></td>
<td>Humansdorp, Komga, East London</td>
</tr>
<tr>
<td>Western Cape</td>
<td>124</td>
<td>?</td>
<td>142</td>
<td>George, Swellendam</td>
</tr>
</tbody>
</table>

Most regions report that the above figures are only a small percentage of the actual cases since private veterinarians and owners tend to treat animals themselves and few of these problems are reported to officers.

Babesiosis in horses also occurred fairly generally. Especially the Eastern Cape and Karoo Region reported a number of cases in the Port Elizabeth area.

In the Ficksburg vicinity (Highveld Region) 4 outbreaks occurred in which 7 horses were affected with 1 mortality and in Klerksdorp a case of abortion due to congenital infection with babesiosis has been reported.

In the George area (Western Cape Region) 2 outbreaks occurred with 11 cases.

Babesiosis in dogs, although it is probably the most common disease condition in dogs, is seldom brought to the attention of officers. Transvaal Region reported an outbreak in the Pretoria district amongst dogs of the Prisons Department: 16 dogs became ill and 6 of these died out of a total of 65 dogs.

At the quarantine station at Jan Smuts Airport, blood smears are made from all imported dogs. Sixty smears were examined for Babesia gibsoni, all with negative results.

Anaplasmosis

Many cases of this important tick-transmitted disease of cattle occurred countrywide with most cases reported from Natal Region (199 outbreaks with 452 cases).

Transvaal Region reported an increase in the number of cases compared to the previous year, namely 40 outbreaks with 72 cattle sick and 30 dying.

In the Northern and Eastern Transvaal most cases are caused by Anaplasma marginale and this region reported 50 cases in 17 outbreaks with 15 mortalities. Outbreaks in regions other than the above are given in Table 11.
### TABLE 11. Anaplasmosis outbreaks in other regions

<table>
<thead>
<tr>
<th>Region</th>
<th>Outbreaks</th>
<th>Cases</th>
<th>Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highveld</td>
<td>54</td>
<td>75</td>
<td>19</td>
</tr>
<tr>
<td>OFS</td>
<td>28</td>
<td>45</td>
<td>33</td>
</tr>
<tr>
<td>Eastern Cape and Karoo</td>
<td>35</td>
<td>85</td>
<td>58</td>
</tr>
<tr>
<td>Western Cape</td>
<td>82</td>
<td>112</td>
<td>27</td>
</tr>
<tr>
<td>KwaNdebele</td>
<td>42</td>
<td>61</td>
<td>7</td>
</tr>
</tbody>
</table>

Countrywide. 952 cases in 497 outbreaks were reported with at least 189 mortalities (no information on mortalities in Natal).

#### Besnoitiosis

Only the Northern and Eastern Transvaal Region reported the occurrence of elephant skin disease. In Pietersburg district 2 bulls were clinically affected and in the Barberton district 11 cases on 7 farms were diagnosed.

In a transmission experiment in which 1 bovine in the Kruger National Park was injected intraperitoneally with 10 million wildebeest strain Besnoitia schizonts, no clinical signs or post-mortem lesions could be detected. KwaNdebele reported 3 outbreaks in 3/106 cases. Owners were advised to slaughter the animals. KaNgwane reported 1 case in government-owned cattle.

#### Coccidiosis

Transvaal Region reported 2 outbreaks in lambs on irrigated pastures with 719/1 320 cases. A feedlot in the Pretoria district had 5/2 000 cases and in Standerton district 7 outbreaks occurred in veld cattle with 141/830 cases treated successfully with sulpha drugs.

Northern and Eastern Transvaal Region reported 54 mortalities in calves in various districts, whilst in the Lydenburg area an outbreak occurred in 40 Angora kids on irrigated pastures. Oocyst counts of up to 500 000/g of faeces were recorded.

In the Kruger National Park, 4/20 impalas kept in captivity died of coccidiosis.

Other regions reported as follows:

- Highveld: 13 outbreaks with 64 cases in chickens, calves, goats and sheep
- OFS: 19 outbreaks with 178 cases in sheep, chickens, goats and cattle
- Natal: 7 outbreaks with 121 cases in sheep, Boer goats and Angora goats
- Eastern Cape and Karoo: 41 outbreaks with 450 cases in chickens, goats, sheep and Angora and Karoo rabbits
- Western Cape: 60 cases in sheep, goats and cattle.

#### Mild bovine theileriosis

KaNgwane reported that frequently in the Nsikazi however, not confirmed. this condition occurs district. Cases were, however not confirmed.

#### Other protozoal diseases

*Trichomonas equi* was isolated from faeces specimens of a year-old foal with chronic diarrhoea in the Messina district. Northern and Eastern Transvaal Region also reported the presence of a *Hemogregarina* spp. parasite seen in the blood smear of a crocodile from the Kruger National Park. *Leishniania tropica* was found in the ears of 5 sheep in
the Barberton area. A heavy infestation of the muscles of a giraffe and warthog with *Sarcocystis* spp. cysts in the Kruger National Park was found.

In KwaNdebele 152 cases of *Ehrlichia (anis* were diagnosed in dogs, more than a 300 % increase compared to the previous report year.

**VIRAL DISEASES**

**Bluetongue**

In spite of the availability of a good vaccine, many outbreaks of bluetongue occurred.

The heavy rains, with resultant filling of pans at the end of the report year, resulted in the drastic increase in numbers of midges. Exceptionally favourable conditions were thus created for insect-transmitted virus diseases.

Fortunately the heavy rains only materialised shortly before the winter season and thus few outbreaks of bluetongue have been reported.

The Free State Region in particular, experienced a sharp increase in incidence with 54 outbreaks compared to the 18 outbreaks reported in the previous year. Table 12 reflects the bluetongue outbreaks reported in the various regions.

**TABLE 12. Bluetongue outbreaks reported in the RSA - 1987/88**

<table>
<thead>
<tr>
<th>Region</th>
<th>Outbreaks</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transvaal</td>
<td>1</td>
<td>70</td>
</tr>
<tr>
<td>N. and E. Transvaal</td>
<td>12</td>
<td>83</td>
</tr>
<tr>
<td>Highveld</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>OFS</td>
<td>54</td>
<td>218</td>
</tr>
<tr>
<td>Natal</td>
<td>41</td>
<td>379</td>
</tr>
<tr>
<td>Eastern Cape and Karoo</td>
<td>28</td>
<td>250</td>
</tr>
<tr>
<td>Western Cape</td>
<td>38</td>
<td>305</td>
</tr>
<tr>
<td>KaNgwane</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>183</strong></td>
<td><strong>1322</strong></td>
</tr>
</tbody>
</table>

Transvaal Region also reported 28 unconfirmed outbreaks with 233 cases.

**African horsesickness**

Relatively few outbreaks of African horsesickness were reported and most of these cases occurred at the end of the year under review.

The Highveld, Eastern Cape and Karoo and Western Cape Regions reported no cases.

Transvaal Region reported 27 cases and mortalities and Northern and Eastern Transvaal 12 cases with 8 mortalities.

In the Free State Region, 2 outbreaks with 4 mortalities occurred.

Natal Region reported 7 outbreaks with 13 mortalities of which 7/28 occurred at a riding school that did not inoculate their horses.

**Heartwater**

This remains the most common disease condition of ruminants in the bushveld regions of the Transvaal and Natal. Outbreaks have been reported in all regions and Table 13 is a reflection of the reported cases.

In KaNgwane 186 animals were treated and 35 deaths occurred.

Countrywide 2 802 reported mortalities occurred in large and small stock. This gives an idea of the economic impact of this disease in the bushveld areas of our country.
TABLE 13 Heartwater outbreaks reported in the RSA – 1987/88

<table>
<thead>
<tr>
<th>Region</th>
<th>Cattle</th>
<th>Sheep</th>
<th>Goats</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Outbreaks</td>
<td>Deaths</td>
<td>Outbreaks</td>
</tr>
<tr>
<td>Transvaal</td>
<td>481</td>
<td>164</td>
<td>15</td>
</tr>
<tr>
<td>N. and E. Transvaal</td>
<td>?</td>
<td>542</td>
<td>?</td>
</tr>
<tr>
<td>Highveld</td>
<td>4</td>
<td>12</td>
<td>-</td>
</tr>
<tr>
<td>OFS</td>
<td>6</td>
<td>21</td>
<td>-</td>
</tr>
<tr>
<td>Natal</td>
<td>110</td>
<td>254</td>
<td>41</td>
</tr>
<tr>
<td>Eastern Cape and Karoo</td>
<td>28</td>
<td>69</td>
<td>60</td>
</tr>
<tr>
<td>Western Cape</td>
<td>4</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Lebowa</td>
<td>?</td>
<td>318</td>
<td>?</td>
</tr>
</tbody>
</table>

Officers of the Northern and Eastern Transvaal Region inoculated 489 cattle, 524 goats, 31 sheep, 3 eland and 2 springbok. Highveld Region officers inoculated 177 cattle. Transvaal Region reported that government herds at Roodeplaat and Groblersdal experienced no problems with heartwater whilst nearby farmers had cases at regular intervals. A strict dipping programme is followed in these government herds that allows a light tick infestation to occur with grazing conditions also optimised. No inoculations of calves are performed.

**Ephemeral fever (3-day stiff sickness)**

The reported incidence of this disease dropped dramatically in all regions compared to the previous report year.

Transvaal Region reported 97 cases with 12 cattle dying, mostly in the Rustenburg area. In the Northern and Eastern Transvaal, 14 cases occurred in the Barberton area and 13 in other districts.

Free State Region reported 12 outbreaks with 16 animals showing clinical signs and 2 dying.

Natal had 11 outbreaks involving 69 cases.

The Eastern Cape and Karoo Region reported that cases occurred regularly in the East London area, but only one outbreak in the Stutterheim district with 9/60 cattle affected was reported.

Small but widely distributed outbreaks in the Malmesbury, George and Worcester districts occurred and Western Cape Region reported 36 outbreaks with 37 cases and 5/257 deaths.

Lebowa diagnosed 31 cases and KwaNdebele 35 cases which represents a small increase compared to the 30 cases of last year.

**Rift Valley Fever and Wesselsbron disease**

The rain, with the associated increase in numbers of vectors, occurred too late in the summer season to result in any significant increase in the incidence of these diseases. Nevertheless, farmers were warned through the media to vaccinate their animals timeously since it was expected that these diseases would flare up in the following summer.

No confirmed cases of Rift Valley Fever or Wesselsbron disease occurred in the year under review.

Officers assisted farmers with the inoculation of stock in Northern and Eastern Transvaal (283 inoculations) and the Highveld Region (224 inoculations in cattle).
Western Cape Region reported that co-operatives approximately in the Calvinia district sold 17400 doses of vaccine to farmers.

**Pulmonary adenomatosis (jaagsiekte)**

This serious form of lung cancer in sheep still occurred sporadically and most cases are from flocks that have been infected for some time.

The Eastern Cape and Karoo Region reported that a farmer in the Molteno district lost about 100 sheep per annum which represented 80-90 % of his total mortality in sheep. In the Sterkstroom area a single case has been diagnosed.

Free State Region reported sporadic cases in a flock of the Department of Prisons in the Rouxville area. In a known infected flock in the Potchefstroom district of the Highveld Region, 6 cases occurred.

Natal Region reported 2 cases in the Dundee area and 1 case in the Underberg area.

**Infectious ophthalmia**

Vitamin A administration has a beneficial effect in most of these cases and vaccination of cattle with the imported *Moraxella* spp. vaccine gave good results.

Since farmers only refer the worst cases to veterinarians, relatively few outbreaks came to the attention of officers.

This disease is reported as common in the Transvaal Region and 15 outbreaks in sheep and cattle came to the attention of officers. An average morbidity of 3 % was found, but in some cases went as high as 25 %.

At the quarantine station at Jan Smuts airport, major problems were encountered in imported caged birds. In Amazon parrots from Argentina 140 cases were seen with 31 mortalities. Of 311 love-birds (from Belgium) which were affected, 81 eventually died. Most deaths occurred as a result of starvation since affected birds cannot see their food. Another 379/890 love-birds from Taiwan were affected, with 296 mortalities.

In the Belfast district of Northern and Eastern Transvaal Region, an epidemic occurred in dairy cattle with 60/72 animals affected. In White River, 40 % of cattle in a herd on kikuyu pastures developed high infection.

The following regions also reported this disease:

<table>
<thead>
<tr>
<th>Region</th>
<th>Outbreaks</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFS</td>
<td>19</td>
<td>Generalised in sheep, goats, cattle and calves</td>
</tr>
<tr>
<td>Eastern Cape and Karoo</td>
<td>8</td>
<td>20% incidence in sheep and 13 % in goats</td>
</tr>
<tr>
<td>Western Cape</td>
<td>9</td>
<td>Generalised distribution in sheep, goats and cattle with an average incidence of 25 %</td>
</tr>
</tbody>
</table>

**Orf**

This condition occurred commonly in all regions. The incidence of this disease increased significantly after the widespread rains. It is suggested that “doringvygie” and “trassiebos” on pastures are predisposing factors that promote the spread of the disease. The autogenous vaccine, as prepared by various laboratories, gave good results in most cases.
Reports of the disease are given in Table 14.

<table>
<thead>
<tr>
<th>Region</th>
<th>Outbreaks</th>
<th>Sheep</th>
<th>Goats</th>
<th>Doses vaccine prepared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transvaal</td>
<td>11</td>
<td>4-5%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>N. and E. Transvaal</td>
<td>16</td>
<td>383</td>
<td>85</td>
<td>?</td>
</tr>
<tr>
<td>Highveld</td>
<td>6</td>
<td>20</td>
<td>&gt;140</td>
<td>1280</td>
</tr>
<tr>
<td>OFS</td>
<td>33</td>
<td>272</td>
<td>335</td>
<td>?</td>
</tr>
<tr>
<td>Natal</td>
<td>55</td>
<td>43</td>
<td>13</td>
<td>1090</td>
</tr>
<tr>
<td>Eastern Cape and Karoo</td>
<td>31</td>
<td>11%</td>
<td>-</td>
<td>?</td>
</tr>
<tr>
<td>Western Cape</td>
<td>19</td>
<td>176</td>
<td>440</td>
<td>2800</td>
</tr>
</tbody>
</table>

**Mucosal disease**

During the year under review large economic losses were suffered in Natal due to mucosal disease. Affected animals tend to die when about 18 months old. Reproduction problems have also been encountered in infected herds. In some herds pregnancy rates were as low as 20 to 30%.

Mucosal disease is frequently not diagnosed correctly, as a result of the difficulty in confirming a diagnosis and the complex epidemiology of this disease. No reliable national statistics thereof are available.

Transvaal Region reported 3 outbreaks in the Pretoria area with 14/239 cases and 6 mortalities.

**Infectious Bovine Rhinotracheitis**

An outbreak at the bull testing centre of the ADSRI, Irene was reported by the Transvaal Region. Mild clinical signs of the disease were observed in 79/230 bulls. Nasal droplet vaccine was used as a preventive inoculation in 440 animals.

One outbreak of the disease was reported by each of the Standerton and Johannesburg State veterinarians (2; 50 cases and 5/5 cases respectively). The outbreaks in Johannesburg involved cattle imported from the USA.

Cattle introduced from Kokstad and Potchefstroom were affected in a serious outbreak reported by Northern and Eastern Transvaal Region. Of 120 dairy cows a large number were clinically affected while 8 aborted.

In the Barberton district, 2 serious outbreaks also occurred; in a Bonsmara herd of 118 cattle the morbidity was 100% and in the other outbreak, 368 cattle in a feedlot were involved.

**Leukosis**

The **Western Cape Region** reported 4 outbreaks. In the Calvinia area 2 cases in sheep were confirmed by the Stellenbosch RVL. At the Vredendal abattoir, 12 cases were seen while on a farm in the Caledon district (monitored during the year) the condition affected 1/62 cattle.

On a farm in the Somerset West area amongst 126 cattle bled for brucellosis, 16 showed a positive titre for bovine leukosis.
Lumpy skin disease

A number of mild lumpy skin disease cases (Allerton type) was reported.

In the Barberton district, 6 outbreaks, with 119 cattle on one farm affected, were reported by the Northern and Eastern Transvaal Region. In the Lydenburg area, 16/240 cases were recorded. Officers vaccinated 403 cattle in this region.

Transvaal Region reported 2 outbreaks with 8/218 cases in the Standerton area and 12 cases in the Rustenburg area.

In the Malmesbury area, Western Cape Region reported 2 outbreaks with 10/20 cattle affected.

Due to the mild clinical symptoms it is likely that few cases are reported and the actual incidence of the disease was probably much higher than reflected here.

Neoplasms

Since most tumours are not-infectious, only individual animals are affected. For this reason this condition is rarely reported and cases generally only come to the attention of officers when investigations into other disease conditions are undertaken.

Squamous cell carcinoma in sheep, where the perineum is generally affected, was most commonly reported. It is postulated that the practice of docking tails very short is a predisposing factor in this type of cancer, since the perineum (and more specifically the vulva of the ewe) is then exposed to sunlight.

In the Uniondale district, this condition in 24/36 SA Mutton Merino ewes, was reported by the Western Cape Region.

A farm in the Fauresmith area regularly reported cases of squamous cell carcinoma in Merino sheep according to the Free State Region. Especially the lips, nose and ears were affected. About 5 cases per annum were diagnosed on this farm. In the same area about 10 cases of melanoma in Angora goats are encountered every year.

Eastern Cape and Karoo Region reported cases of squamous cell carcinoma in 3 Angora goats and 1 sheep. One sheep and 1 goat were also affected by melanocarcinoma in this region.

A few cases of squamous cell carcinoma have also been reported by Transvaal Region (1 bovine and 1 goat), and Northern and Eastern Transvaal Region (1 case).

Papillomatosis

Mainly young animals are affected by this type of infectious skin tumour. Major problems with the control of the condition can be encountered once it has been established in a group of animals. The control of this condition depends on the use of autogenous vaccine. Most of the laboratories of this Directorate prepared this kind of vaccine on request.

In the Free State Region, 5 outbreaks in cattle with 22 cases were reported. Highveld Region reported that 1,409 doses of vaccine were prepared and Western Cape Region prepared 86 doses.

Papillomas, probably caused by a herpes virus, have been noted in small elephants in the Kruger National Park. Giraffes were also affected by warts caused by a papilloma virus.
Other viral diseases

In the Trompsburg district of the Free State Region a suspected case of chlamydiosis occurred in a bovine. Pathological changes in the brain indicated sporadic bovine encephalomyelitis (SBE).

In a lamb in the Fauresmith area, a suspected case of Border disease was found. Eastern Cape and Karoo Region reports that herpes virus in horses (equine viral rhinopneumonitis) occurs regularly in the Port Elizabeth State veterinarian area.

Parvo virus infection and distemper in dogs, treated primarily by private veterinarians, occurred generally throughout the country.

FUNGAL DISEASES

Ringworm

This condition occurs mostly in late winter and early summer. Outbreaks have been recorded in goats, cattle, horses, pigs and sheep. Fourteen cases of the disease were seen at the quarantine station at Jan Smuts in cattle imported from the USA and France. Another 2 outbreaks in cattle, where 157/659 cases occurred, were reported in the Transvaal Region.

In the Malelane district of the Northern and Eastern Transvaal Region, 187 sows were affected with Microsporum nanum. Seven horses were affected with ringworm in the Soutpansberg district.

Ringworm occurs sporadically in the Free State Region where 4 outbreaks with 72/422 cases in cattle, goats and sheep were reported.

Western Cape Region reports that the disease occurs commonly in calves.

Lumpy wool and Sencobo disease

After the heavy rains in February 1988, this condition was especially prevalent in the Free State Region. More than 1 000 cases in 12 outbreaks were reported.

Transvaal Region reported 7 outbreaks with 326/3 425 cases in the Standerton area, while isolated cases occurred in the Lydenburg area of the Northern and Eastern Transvaal Region.

From the Eastern Cape and Karoo Region, lumpy wool has been recorded in 18/7 12 sheep.

Western Cape Region reported that many cases occur but are not officially reported to them.

Streptothricosis

Dermatophilus congolensis was isolated from skin lesions in a horse in the Letaba district (Northern and Eastern Transvaal Region). The same organism was also isolated in cases of lumpy wool in sheep in the Eastern Cape and Karoo Region.

Aspergillosis

At the quarantine station, Jan Smuts, Aspergillus spp. were isolated from 2 7 African Grey parrots imported from Zaire.

(For other cases, see Poulters diseases.)
INFERTILITY AND REPRODUCTIVE DISEASES

General

Cattle

Since private veterinarians were more and more involved in herd health schemes in many areas, the involvement of State veterinarians in routine pregnancy examinations decreased. As the feedback from private veterinarians on calving percentages was very limited, no national figures in this respect can be given.

Officers are actively involved with State herds and Table 15 reflects these activities.
TABLE 15. Pregnancy examinations performed by State veterinarians - 1987/88

<table>
<thead>
<tr>
<th>Region</th>
<th>Rectal examinations</th>
<th>Average % pregnant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transvaal</td>
<td>1272</td>
<td>72</td>
</tr>
<tr>
<td>N. and F. Transvaal</td>
<td>21 499</td>
<td>66</td>
</tr>
<tr>
<td>Highveld</td>
<td>1169</td>
<td>78</td>
</tr>
<tr>
<td>OFS</td>
<td>924</td>
<td>61</td>
</tr>
<tr>
<td>Natal</td>
<td>?</td>
<td>79</td>
</tr>
<tr>
<td>Eastern Cape and Karoo</td>
<td>347</td>
<td>47 (problem herds)</td>
</tr>
<tr>
<td>Western Cape</td>
<td>576</td>
<td>63</td>
</tr>
<tr>
<td>Total</td>
<td>25 786</td>
<td>65</td>
</tr>
</tbody>
</table>

Poor nutrition seems to be the major factor that affects reproduction negatively. In the northern parts of the country, the pregnancy percentages of beef cattle were dramatically affected by the drought conditions.

The breeding ability of bulls tested in various regions is reflected in Table 16.

TABLE 16. Breeding ability of bulls

<table>
<thead>
<tr>
<th>Region</th>
<th>Bulls tested</th>
<th>Culled</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transvaal</td>
<td>35</td>
<td>7</td>
<td>20</td>
</tr>
<tr>
<td>N. and E. Transvaal</td>
<td>489</td>
<td>48</td>
<td>10</td>
</tr>
<tr>
<td>Highveld</td>
<td>30</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>OFS</td>
<td>24</td>
<td>5</td>
<td>21</td>
</tr>
<tr>
<td>Western Cape</td>
<td>34</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

The AI and Reproduction section tested 317 bulls for approval and re-approval for certification at various AI centres.

This section also examined 57 bulls and 75 I cows in various State herds.

Sheep

Ram testing and specific problem investigations were the main activities undertaken. Table 17 gives an indication of the work involved.

TABLE 17. Rams examined in the RSA - 1987/88

<table>
<thead>
<tr>
<th>Region</th>
<th>Rams examined</th>
<th>Rams with abnormalities Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>N. and E. Transvaal</td>
<td>120</td>
<td>13 (11)</td>
</tr>
<tr>
<td>Highveld</td>
<td>130</td>
<td>13 (10)</td>
</tr>
<tr>
<td>OFS</td>
<td>8752</td>
<td>? (&gt;25)</td>
</tr>
<tr>
<td>Eastern Cape and Karoo</td>
<td>5336</td>
<td>395 (7)</td>
</tr>
<tr>
<td>Western Cape</td>
<td>6270</td>
<td>561 (9)</td>
</tr>
</tbody>
</table>

A number of abortions have also been investigated.

Several abortions in goats in the Transvaal Region have been found to be due to leptospirosis. Abortions in 55 goats in 3 outbreaks, due to an unknown cause, were reported by the Northern and Eastern Transvaal Region.

The Free State Region reported 13 outbreaks of abortion or stillbirth in goats and sheep. Of the 280 kids and lambs, 18 were presented for evaluation. In one outbreak *Coxiella burnetui* (Q fever) was confirmed and chlamydiosis in another. The use of bluetongue vaccine in pregnant ewes was suspected of being a factor in one other
outbreak.

Ostriches

The Western Cape Region was involved in investigations into poor hatchability of ostrich eggs. Management problems such as feeding and a prolonged breeding season were identified as contributing factors. Hatchability as low as 30% was found in various instances.

Semen collection methods in ostrich males were investigated by an officer and a private veterinarian. Reasonable success seems to be possible.

Horses

As a result of possible parasite problems, artificial insemination of Percheron horses at Elsenburg College of Agriculture produced poor results. The semen was donated by the French Government.

Vibriosis

Officers were involved in taking and/or examining sheath washes on both a routine basis and where problems were encountered with reduced fertility. Table 18 gives an indication of activities and diagnoses made.

All bulls at AI stations were also sheath washed and tested.
Vaccination of 1 001 animals was reported by Highveld Region.

TABLE 18. Sheath washes taken and examined for vibriosis 1987/88

<table>
<thead>
<tr>
<th>Region</th>
<th>No. of washes</th>
<th>Bulls pos. Number</th>
<th>Herds infected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transvaal</td>
<td>427</td>
<td>77 (18)</td>
<td>10</td>
</tr>
<tr>
<td>N. and E. Transvaal</td>
<td>1 076</td>
<td>9 (0.8)</td>
<td>?</td>
</tr>
<tr>
<td>Highveld</td>
<td>761</td>
<td>7 (0.9)</td>
<td>6</td>
</tr>
<tr>
<td>OFS</td>
<td>881</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>Natal</td>
<td>1 422</td>
<td>15</td>
<td>7</td>
</tr>
<tr>
<td>Eastern Cape and Karoo</td>
<td>550</td>
<td>7 (1.3)</td>
<td>4</td>
</tr>
<tr>
<td>Western Cape</td>
<td>108</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Trichomoniasis

In many instances sheath washes were examined for both vibriosis and trichomoniasis. Table 19 reflects the results.

<table>
<thead>
<tr>
<th>Region</th>
<th>No. of washes</th>
<th>Bulls pos. Number %</th>
<th>Herds infected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transvaal</td>
<td>377</td>
<td>57 (15)</td>
<td>&gt;5</td>
</tr>
<tr>
<td>N and E Transvaal</td>
<td>1076</td>
<td>46 (4,3)</td>
<td>?</td>
</tr>
<tr>
<td>Highveld</td>
<td>1434</td>
<td>51 (3,6)</td>
<td>17</td>
</tr>
<tr>
<td>OFS</td>
<td>1609</td>
<td>171 (10,6)</td>
<td>&gt;53</td>
</tr>
<tr>
<td>Natal</td>
<td>4659</td>
<td>186 (3,2)</td>
<td>87</td>
</tr>
<tr>
<td>Eastern Cape and Karoo</td>
<td>550</td>
<td>2 (0,4)</td>
<td>2</td>
</tr>
<tr>
<td>Western Cape</td>
<td>108</td>
<td>0 (0)</td>
<td>0</td>
</tr>
</tbody>
</table>

Compared to last year, the incidence of the disease increased dramatically during the year under review. The incidence of 4.8 % (of cattle tested) compared to 2 % of the previous year is a cause for concern. The increase may, however, be due to more awareness amongst farmers who did not previously test for poor fertility.

Chlamydiosis

This condition (enzootic abortion) that can cause a wide range of pathology, was diagnosed in sheep, goats, cattle and rabbits. Investigations were mainly initiated where abortions occurred in flocks or herds.

In the Transvaal Region, 4 outbreaks in sheep with lamb mortalities, mainly due to pneumonia, resulted in 111 / 1 700 animals dying.

In sheep in the Highveld Region, 6 outbreaks resulting in abortions and weak lambs (26/270 cases) were reported. and 2 cases in cattle. Cerebral involvement also resulted in the death of 2 calves.

Free State Region reported 8 outbreaks in sheep and goats with more than 63 cases of abortion or stillborn lambs.

Eastern Cape and Karoo Region experienced many problems with this condition and reported 13 outbreaks in sheep, 3 in cattle, 2 in goats and a single case of pneumonia in a rabbit. In these outbreaks, 377 animals were either sick or aborted and 51 died.

Chlamydiosis occurred sporadically in the Western Cape Region with 1 confirmed outbreak in sheen where 8/140 animals aborted.

Actinobacillus seminis

This condition is diagnosed by semen examination and serological testing.

Highveld Region reported 3 cases. Free State Region reported 203/4 475 diagnoses based on semen examinations and 122/4 277 on serological testing.

Eastern Cape and Karoo Region reported 103/5 336 cases based on semen examination and 5 positive with 2 suspicious cases from 52 serological evaluations.

Western Cape Region reported a total of 588/7 820 cases.

Brucella ovis

The following cases were reported:

<table>
<thead>
<tr>
<th>Region</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free State</td>
<td>290/8 752</td>
</tr>
<tr>
<td>Eastern Cape and Karoo</td>
<td>92/5 336</td>
</tr>
<tr>
<td>Western Cape</td>
<td>184/5 442</td>
</tr>
</tbody>
</table>
This condition in Angora goats was researched by Middelburg (Cape) RVL. No positive cases could be found when bacteriological records as far back as January 1979 were examined. From transmission experiments the conclusion was drawn that Angora rams should not be vaccinated with the Rev I vaccine unless a positive diagnosis of *B. ovis* infection in the flock is made or if *B. mellitensis* abortions occurred.

**Balanopostitis/Vulvitis**

As a result of the negative publicity that it may elicit, this condition, which mainly affects Dorper sheep, has been poorly reported.

In the Free State Region, 31 outbreaks in which 155 rams were involved were reported, while Western Cape Region had 8 confirmed outbreaks. Of 4 551 rams tested, 37 showed lesions.

Middelburg (Cape) RVL successfully transmitted this condition by means of contaminated swabs. Transmission from ewes to rams and also from rams to ewes and rams was accomplished. *Mycoplasma* spp. and *Ureaplasma* spp. were isolated and identified by Onderstepoort VRI.

Apart from outbreaks in the Burgersdorp area, Eastern Cape and Karoo Region also reported a further 7 outbreaks in the Region with 235/318 cases.

**Epivag (Epididymitis - Vaginitis)**

This disease was only reported by the Transvaal Region in a herd in the Standerton district, where natural breeding resulted in zero conception. Upon investigation it was found that all 7 bulls on the farm had epididymitis and that 25% of the cows had metritis with peritonitis.

**Q fever**

*Coxiella burnetii* caused 1 abortion outbreak in cattle in the Transvaal Region. Out of 26 cows, 5 were found positive and 6 suspicious. Serologically 2/26 goats in the Rustenburg district gave suspicious reactions.

One ewe in the Northern and Eastern Transvaal Region that aborted gave a serologically positive titre while 77 cattle reacted negative.

The Highveld Region reported 7 outbreaks (4 in sheep, 2 in cattle and 1 in a horse) resulting in 9 abortions.

In the Kuruman area of the Free State Region, an abortion storm resulted in 60% of a flock of sheep aborting. *C. burnetii* was confirmed as the cause

**OTHER REPRODUCTIVE DISEASES**

*Histophilus ovis* was isolated from the semen of 1 / 12 rams in the Highveld Region.

In an outbreak of necrotic postitis in Dorper rams in the Upington area of the Free State Region, *Corinebacterium renale* was isolated in 6/25 cases.

**CALF DISEASES**

**White scours**

This disease seems to be one of the most common calf diseases in dairy herds, and in most instances unhygienic management conditions were the predisposing factor.
Confirmed cases of diarrhoea as a result of *F. coli* are reflected in Table 20.

**TABLE 20. Confirmed diarrhoea outbreaks caused by *E. coli* -1987/88**

<table>
<thead>
<tr>
<th>Region</th>
<th>Outbreaks</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transvaal</td>
<td>16</td>
<td>157/670</td>
</tr>
<tr>
<td>N. and E. Transvaal</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>Highveld</td>
<td>7</td>
<td>56</td>
</tr>
<tr>
<td>OFS</td>
<td>5</td>
<td>8/53</td>
</tr>
<tr>
<td>Natal</td>
<td>6</td>
<td>11</td>
</tr>
<tr>
<td>Eastern Cape and Karoo</td>
<td>8</td>
<td>67/256</td>
</tr>
<tr>
<td>Western Cape</td>
<td>8</td>
<td>18</td>
</tr>
</tbody>
</table>

**Paratyphoid**

Confirmed cases of infection with *Salmonella* spp. are shown in Table 21.

**TABLE 21. Confirmed cases of Salmonella spp. infection -1987/88**

<table>
<thead>
<tr>
<th>Region</th>
<th>Outbreaks</th>
<th>Cases</th>
<th>Organism (when known)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transvaal</td>
<td>5</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td>N. and E. Transvaal</td>
<td>8</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td>Highveld</td>
<td>3</td>
<td>18</td>
<td><em>S. typhimurium</em> and <em>S. dublin</em></td>
</tr>
<tr>
<td>OFS</td>
<td>3</td>
<td>7</td>
<td><em>S. gloucester</em></td>
</tr>
<tr>
<td>Natal</td>
<td>23</td>
<td>64</td>
<td><em>S. typhimurium</em> and <em>S. dublin mainly</em></td>
</tr>
<tr>
<td>Eastern Cape and Karoo</td>
<td>3</td>
<td>9</td>
<td><em>S. enteridis</em> and <em>S. dublin</em></td>
</tr>
<tr>
<td>Western Cape</td>
<td>9</td>
<td>24</td>
<td></td>
</tr>
</tbody>
</table>

**Calf diphtheria**

Transvaal Region reported 2/4 affected animals dying while 2 others were treated successfully. Northern and Eastern Transvaal Region reported a single case while Highveld Region reported 1 outbreak with 4 animals affected and 1 that died.

**Sweating sickness**

This condition was found fairly regularly within the distribution area of the bontlegged tick (*Hyaloninia truncatum*). Northern and Eastern Transvaal reported 28 cases and 1 death in 12 outbreaks, and 7 outbreaks with 11 cases were reported in the Transvaal Region. The condition was especially prevalent in the Rustenburg area. In the Free State Region, 4 outbreaks with 19 cases and 2/56 mortalities were reported.
POULTRY DISEASES

Bacillary white diarrhoea

One outbreak was reported from the Transvaal Region.
   At Jan Smuts airport quarantine station, 633/3 466 (18%) imported birds died as a result of this disease.

Fowl typhoid

No cases were reported.

Fowl cholera

In 1 outbreak in the Eastern Cape and Karoo Region, 27 mortalities occurred and 50/600 cases were found.
   The Poultry Section at Onderstepoort reported 1 outbreak.

Infectious bronchitis

The virus was isolated in the Natal Region from broilers and young pullets where conjunctivitis, sinusitis and mucoid tracheitis were found. Investigations are under way to determine whether this virus is the Massachusetts vaccine type or not.
   In the Eastern Cape and Karoo Region 2 outbreaks resulted in 1 050 deaths with a further 350 chickens clinically ill.
   The Western Cape Region reported that the live vaccine resulted in effective control in the areas where the disease was commonly encountered.
   The Poultry Section reported 9 cases.

Infectious laryngotracheitis

Northern and Eastern Transvaal Region reported 40 mortalities while the Poultry Section (Onderstepoort) had 1 suspect case. In the Eastern Cape and Karoo Region, 1 outbreak was reported and the Poultry Section (Onderstepoort) reported 2 outbreaks.

Chronic respiratory disease (mycoplasmosis)

This condition was widely reported. The Poultry Section (Onderstepoort) diagnosed 12 outbreaks in chickens and 1 in racing pigeons.
   Northern and Eastern Transvaal reported 300 fatalities and the laboratory at Potgietersrus diagnosed this condition in 36 post-mortems.
   Highveld Region reported 22 outbreaks with 282 cases and announced that this condition was generalised in the area.
   The disease was also found to be generalised in the Natal Region. In the Eastern Cape and Karoo Region, 100/3 200 mortalities occurred in broilers with arthritis as the primary lesion.
   A decrease in the incidence of *M. galliseptenum* was reported by the Western Cape Region in broilers but layers are still infected, with a resultant 5 to 10% drop in egg production.
Fowl pox

In spite of few reports of this disease, it is considered to be widespread in poultry and birds. The following have been reported by the various regions:

<table>
<thead>
<tr>
<th>Region</th>
<th>Outbreaks</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transvaal</td>
<td>9</td>
<td>chickens dead and 11 sick out of 100</td>
</tr>
<tr>
<td>N. and E. Transvaal</td>
<td>10</td>
<td>pouls died</td>
</tr>
<tr>
<td>OFS</td>
<td>2</td>
<td>outbreaks with 6 mortalities</td>
</tr>
<tr>
<td>Karoo</td>
<td>8 ISO canaries affected</td>
<td></td>
</tr>
<tr>
<td>Eastern Cape and</td>
<td>30/100</td>
<td>chickens died</td>
</tr>
<tr>
<td>Generalised amongst pigeons</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Western Cape</td>
<td>5</td>
<td>cases in chickens</td>
</tr>
<tr>
<td>Poultry Section (OP)</td>
<td>5</td>
<td>outbreaks in chickens. 1 outbreak in quails</td>
</tr>
</tbody>
</table>

Infectious bursal disease (Gumboro)

It is believed that the disease is generalised in Natal Region amongst broilers and predisposes to other disease conditions.

Highveld Region reported 1 outbreak with 16 deaths and the Poultry Section (OP) diagnosed 2 cases.

Epidemic tremor

No cases were reported.

Marek’s disease

This condition was reported as follows~

<table>
<thead>
<tr>
<th>Region</th>
<th>Outbreaks</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transvaal</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>N. and E. Transvaal</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Highveld</td>
<td>5</td>
<td>26</td>
</tr>
<tr>
<td>OFS</td>
<td>2</td>
<td>58</td>
</tr>
<tr>
<td>Western Cape</td>
<td>1</td>
<td>126</td>
</tr>
<tr>
<td>Poultry Section (OP)</td>
<td>-</td>
<td>128</td>
</tr>
</tbody>
</table>

An increased incidence of neoplasia caused by viruses was found in the Natal Region amongst hens (15 to 30 weeks of age) which represents both Marek’s disease and lymphoid leukosis.

Western Cape Region reported that Marek’s disease was seen in 0.2 % of all poultry post-mortems performed at Stellenbosch RVL.

Lymphoid leukosis

Northern and Eastern Transvaal reported 5 cases while Highveld Region reported 2 outbreaks with an unknown morbidity.
Colisepticaemia

Under conditions of poor housing, this disease is common.

The following was reported:
Transvaal
N. and E. Transvaal -
Highveld
Eastern Cape and Karoo
Poultry Section
(OP)
Transvaal 400/4 600 mortalities in broilers
N. and E. Transvaal 7 outbreaks with 5 165/25 000 mortalities in broilers
5/50 mortalities in homing pigeons as a result of septicaemia
Highveld 6 outbreaks with 290 mortalities (chickens) and 4 mortalities (pigeons)
Eastern Cape and
Karoo
Poultry Section 50 outbreaks in chickens
1 chicken and I kestrel
5 outbreaks in quails
3 outbreaks in ducks

Ascites~ (water belly)

The Poultry Section (OP) found 528 cases of this condition. Transvaal Region reported 1 outbreak with 16/100 mortalities.
In Northern and Eastern Transvaal Region, a large outbreak resulted in 1 680/12000 mortalities.
At post-mortem 24 cases were diagnosed at the Potgietersrus laboratory.
Highveld Region reported 9 outbreaks with 24 cases.
Free State Region reported 2 outbreaks with 2 and 35 mortalities respectively.

Egg drop syndrome

No cases were reported.

Gizzard erosion

The Poultry Section (OP) diagnosed 36 cases in chickens, 22 in quails and 2 outbreaks in parrots.
In the Highveld Region 6 outbreaks with 48 cases were reported.

Coccidiosis

In spite of the availability of a whole range of effective coccidiostats for continuous prevention through feed, this condition is still seen regularly.
Northern and Eastern Transvaal Region reported 10 deaths out of 185 as a result of _Eimeria tenella_ and _F. necatrix_. Two cases were diagnosed at the Potgietersrus laboratory.
From the Kroonstad area of the Highveld

Region, 3 outbreaks with 53/7 500 mortalities were reported.
_E. acervulina_ was responsible for 81 / 1 540 mortalities in the Eastern Cape and Karoo Region. while the Poultry Section (OP) reported 14 outbreaks in broilers, 4 in layers and I in racing pigeons.
Trichomoniasis
The Poultry Section (OP) reported 1 outbreak in pigeons.

Paramyxovirus
After the wide distribution of this disease in racing pigeons last year, only a single case was reported by the Highveld Region this year. Good immunisation programmes by pigeon owners were probably responsible for this changed situation.

*Staphylococcus aureus* arthritis
In chickens, 1 outbreak with 30/300 mortalities was reported by Eastern Cape and Karoo Region. The Poultry Section (OP) diagnosed 10 cases.

Necrotic enteritis
No cases were reported.

Deficiency diseases
Highveld Region reported 16/200 cases of folic acid deficiency in chickens.

Aspergillosis
In the Upington area of the Free State Region, 112 deaths in Palm cockatoos were reported.
   The Poultry Section (OP) isolated the following:

   *A. fumigatus*       6 cases
   *A. terreus*         1 outbreak in finches
   *A. niger*           1 outbreak in parrots

Parasites
Eastern Cape and Karoo Region reported infestations with *Heterakis* spp. in 1 outbreak and *Ascaris* spp. in 2 outbreaks.
   The Poultry Section (OP) diagnosed the following:

   Roundworms - 2 outbreaks in chickens
   - 1 outbreak in parakeets
   - 1 outbreak in guinea fowls
   Tapeworms - 6 outbreaks in parrots
   - 1 outbreak in pigeons

   *Aegyptianella* spp. was also seen in chickens and *Haetnoproteus* spp. chickens and 1 in cockatoos.
   in 1 outbreak in 2 cases in

Other diseases
*Inclusion body hepatitis*, caused by an adenovirus. resulted in a broiler enterprise in the Northern and Eastern Transvaal Region being forced to systematically cull 25 000
broilers after the disease was diagnosed.

DISEASES OF OSTRICHES

White-muscle disease resulted in the death of 8 ostriches with a further 12/140 paralysed in the Eastern Cape and Karoo Region. In 3-month-old ostriches, ascites was also observed.

As a result of obstruction between the gizzard and proventriculus due to coarse feed, 62/150 week old chickens died. This condition also caused 24/60 mortalities in 1 unit in the Western Cape Region.

Perforation of the proventriculus by foreign objects was found in 9 outbreaks resulting in 118/2800 mortalities in 1 to 6-month-old ostriches in the Western Cape.

Infection with Salmonella in incubators led to the death of 2 300/2 600 chicks within the first 3 days after hatching at one unit.

At 24 units, mortalities of 2447/4 132 chicks of 1 to 10 weeks of age was caused by F. coli. Poor standards of management was the primary predisposing factor.

DISEASES OF PIGS

Most disease conditions in pigs are handled by veterinarians associated with the Pig Health Scheme of the Meat Board.

Colibacillosis

The generalised presence of F. coli (Strain 0149:K91,88), resulting in clinical cases was reported by the Western Cape Region. Cases occur when animals are stressed even where vaccination is done. In some cases resistance to a wide range of antibiotics was found.

Vibrionic diarrhoea (swine dysentery)

Only 1 case, caused by Camp vlobacter jejuni was reported by the Eastern Cape and Karoo Region. Most big units control this disease through medicated feeding.

Mange

This disease which occurs generally was poorly reported. The Eastern Cape and Karoo Region reported 1 outbreak in weaners and 3 outbreaks with 79/177 pigs affected, were reported by the Western Cape Region.

Actinobacillus pleuropneumoniae

This disease was confirmed on 2 farms in the Western Cape Region, 1 in the Tulbagh district and another in the Paarl district. The organism was isolated from pigs suffering from pneumonia, pleuritis and pericarditis. The organism was also isolated by the laboratory at Potgietersrus from the lungs of a pig.

Streptococcus suis

According to Western Cape Region the organism is isolated with increased frequency from cases of meningitis. endocarditis and septicaemia in pigs. It occurs sporadically in
all age groups and has been identified on a number of pig farms.

Polyarthritis

One case due to *Streptococcus pvogenes* was reported by the Eastern Cape and Karoo Region.

Salt poisoning

This condition was reported twice in the Eastern Cape and Karoo Region (23/70 deaths)

Atrophic rhinitis

Allerton RVL of the Natal Region confirmed this condition by isolating the causative organism from pigs originating from the Estcourt district. *Bordetella bronchiseptica* and *Pasteurella multocida* were isolated from slaughter pigs showing atrophy of the turbinates and nasal septum. Clinical cases were found on 7 farms in the Natal midlands.

Vitamin E deficiency

Mulberry heart disease was diagnosed in the Natal Region where 20 deaths occurred in 1 unit in the Mooi River area. Severe haemorrhaging in the myocardium, lung oedema, hydrothorax and hydropericardium were conspicuous pathology at post-mortem.

A well known commercial ration that caused no problems in other units, was fed. Mortalities ceased after the vitamin E level in the ration was doubled.

Greasy pig disease

Northern and Eastern Transvaal Region reported 1 outbreak in piglets where 16 animals were affected.

DISEASES OF FISH

In areas where commercial trout farming is practised, officers were involved in the sampling of fish and ovarian fluid for virological evaluation.

No outbreaks of *infectious pancreatic necrosis* occurred inland. A number of farms, sampled on a 6-monthly basis, tested negative.

From a farm certified by the Directorate, trout ova were exported to the Northern Hemisphere for the first time.

Import permits were issued for the importation of 7,95 million trout ova and 200 000 salmon ova from Western Europe. Each consignment of ova was sampled on arrival and tested for infectious pancreatic necrosis, haemorrhagic septicaemia and infectious haemopoietic necrosis, with negative results.

*Streptococcosis*, bacterial gill disease and ammonia poisoning still occur regularly. *Hepatosis*. due to fungal contamination of feed, caused losses on a trout farm in the Western Cape Region.
DEFICIENCY DISEASES AND NUTRITIONAL IMBALANCES

Climatic extremes characterised the year under review. Severe drought in large parts of the country, especially the Northern Transvaal bushveld, led to dramatic reductions in animal numbers.

In 1988 heavy rains and floods resulted in the death of thousands of animals as a result of drowning, exposure and hunger. In many cases pastures were washed away by flood water and, in other instances, covered in silt, resulting in a feed shortage.

Phosphorus deficiency

Transvaal Region reported 1 outbreak in cattle in the Vrede district, with 50 % of the herd showing signs of stiffness, while emaciation and pika were also seen.

Three outbreaks were reported by the Free State Region: 1 in the Kimberley area with 3/38 cows affected and 2 in the Kuruman area with 18/3 020 cases. In sheep, 1 outbreak was also reported with 1/9 rams showing bilateral deviations of the carpus.

Western Cape Region reported 1 outbreak in the Robertson area, with 10/150 cattle showing clinical symptoms.

Calcium deficiency

In the Fauresmith area of the Free State Region, 1 outbreak in ewes on veld was reported. Within 2 weeks of moving the animals to lucerne grazing, the limping observed cleared up.

Magnesium deficiency

Free State Region reported 2 outbreaks in sheep in the Bloemfontein area in which 70/400 lambs and 6/900 ewes died. From the Fauresmith area, 6 outbreaks in sheep with 9 mortalities and another 10 affected, and 2 outbreaks in cattle with 2 mortalities were reported.

Cobalt deficiency

Cobalt deficiencies seem to be generalised in the duneveld of the Western Cape Region. From the Bredasdorp area 1 outbreak was reported with 10/150 sheep dying and in another outbreak in the Malmesbury area 30 lambs died on 1 farm. On 2 farms in the region, a cobalt and selenium deficiency was found with 20/470 sheep affected and 7 dying.

Manganese deficiency

Northern and Eastern Transvaal Region reported 2 outbreaks - one in the Messina area where poor growth was seen in sheep and another in 4 hartebeest kept in quarantine on a diet consisting exclusively of lucerne.

Copper deficiency

In the Western Cape Region this condition was diagnosed on 13 different properties. In the Swellendam area, 10 farms were affected with 934/1 000 clinical cases in sheep resulting in 4 mortalities. Concomitant deficiencies of copper, selenium and zinc occurred
Clinical signs of a copper and selenium deficiency affected 5/100 eland in the Bredasdorp area.
In a random test on 10 farms in the Uniondale, George and Joubertina districts, in which 100 specimens were taken from 3 560 sheep, low copper values were detected in all cases. In the Uniondale district a low selenium level was also detected.

Vitamin A deficiency

This was commonly encountered during the drier periods of the year and gave rise to ophthalmia, retained afterbirth and poor reproduction.

Vitamin B1 (thiamine) deficiency

This condition, which can result from endogenous or exogenous thiaminases, occurred countrywide.
Highveld Region reported 1 case of cerebrocortical necrosis in a calf.
The Western Cape Region stated that this condition was common in sheep during the winter months and reported 19 deaths in the Malmesbury region.
The Eastern Cape and Karoo Region reported serious problems at a bull testing station where 179 bulls were involved. Thiamine breakdown in the rumen occurred as a result of a low degree of acidosis due to a fibre deficiency in the diet. A variable degree of rumen disfunction was detected in all bulls involved, while 1 bull died with typical laminar cortical necrosis on post-mortem. While most bulls recovered after vitamin B 1 administration, some remained blind.

Vitamin E/selenium deficiency

Animals on young lush pastures seem to be more commonly affected. Transvaal Region reported 1 outbreak in lambs in the Piet Retief area with 40/400 cases of white-muscle disease. In the Rustenburg area, 2 pigs also died.
An outbreak in young penned sheep was reported in the Northern and Eastern Transvaal Region.
Free State Region reported 6 outbreaks; 4 in lambs with more than 11 mortalities, 1 in calves with 3/70 affected and 1 in ostrich chicks with 10/53 deaths.
Western Cape reported 5 outbreaks with 10/10 cattle and 374/651 sheep affected and 16 fatalities.

Protein deficiency

A protein deficiency in a herd of cattle in the Barberton area of the Northern and Eastern Transvaal Region resulted in a calving percentage of only 52 %. The grazing that was available to the animals had a protein content of between 1,6 and 3,2%.

Acidosis

Where grain had been fed as a result of drought, this condition was generalised because farmers did not take adequate precautions against excessive intakes.
All regions reported acidosis and many cases were seen, especially in the Free State Region where 21 outbreaks resulted in 120 sheep dying and another 124 becoming clinically affected. Transvaal Region reported 112/2 766 deaths in sheep.
Domsiekte

Over-fat multiparous ewes were mainly affected by this condition. The Western Cape Region reported 22 outbreaks with 37 cases, Eastern Cape and Karoo Region 7 outbreaks, Free State Region 4 outbreaks with more than 15 deaths and Highveld Region 6 mortalities.

Urolithiasis

From the Free State Region, 12 outbreaks in sheep, 1 in goats, 1 in cattle and 1 in Angora goats were reported, with a total of 79 cases of which 67 died.

Other regions reported sporadic cases especially where rams had a high intake of phosphate due to predominantly grain feeding

Other conditions

Four outbreaks of bloat were reported by the Western Cape Region with 25/200 cases in cattle of which 17 died. In the Transvaal Region 2/34 deaths in cattle and 5/19 cases in sheep were reported.

Ketosis in cattle was reported by the Transvaal Region and Eastern Cape and Karoo Region. The Western Cape Region reported fatalities in the Bredasdorp area.

Phytobezoars caused the death of 5/100 lambs in the Upington area. From the Eastern Cape and Karoo Region, 2 outbreaks were reported in which the grass Stipagrostis spp. was involved, and caused the death of 12 sheep.

Swelsiekte was reported by the Eastern Cape and Karoo Region where it affected 200/3 600 goats.

Constipation due to sand intake was reported by the Free State Region with 5 outbreaks and 7 mortalities in cattle and 1 in a horse. In the Calvinia district of the Western Cape Region this condition also resulted in the death of 51 sheep in 6 outbreaks.

Stress due to handling resulted in the death of 16/148 Angora rabbits in the Eastern Cape and Karoo Region. In the same Region azoturia led to the death of 1 horse and 4/6 greyhounds.

Vrvburg hepatosis, resulting in sand impaction, remained a problem in certain camps on the Ghaapse Berg between Reivilo and Vryburg in the Free State Region. To avoid a high mortality in calves up to 3 months of age, they have to be penned continuously.

Manganese poisoning seems to be the primary cause of this condition, with an iron deficiency also playing a role.

POISONING

Poisoning not due to toxic plants

Organ ophosp hates

This group of pesticides was again responsible for many fatalities, both as a result of malicious poisoning and the negligent use of the compounds

Transvaal Region reported that 30/30 pigeons died, 60/60 goats died (improper application of dip), 2/7 cattle died (farmer mixed two pour-on acaricides), and 9/412 cattle
died (negligent handling of dip).

Northern and Eastern Transvaal Region reported the death of 2 geese, 1 dog and 10 chickens as a result of incorrect use of pesticides. In the same Region it was also reported that a farmer in the Phalaborwa area contaminated an impala carcase with Folidol to get rid of a lion. However, he managed to kill 87 vultures.

In the Waterberg district, 37 cattle and 22 calves died when parathion was present in a dipping material, but its presence could not be explained. In the Soutpansberg, 25/ 368 cattle died after the owner used parathion as an acaricide. An unknown organophosphate led to the death of 45 sheep in the Nelspruit vicinity.

Highveld Region reported the death of 1 bovine, 40/60 guinea fowl, 10 wild birds and 6 dogs as a result of organophosphates.

Free State Region reported 1 sick bovine after its whole body was treated with a pour-on preparation. After the application of 100 times over strength diazinon on weaner pigs, 2 died while 10 were sick. Lujet was responsible for the death of 2 chickens and 10 dogs in this Region while chlorpyrifos caused the death of 1 meercat.

Eastern Cape and Karoo Region reported 18 cattle, 7 sheep, 3 dogs, 95 guinea fowl and 36 pigeons dying of organophosphate poisoning.

Western Cape Region reported the death of 10 goats and another 130 affected in one case. In another instance, 150 one to two-day-old piglets died within 3 days after sows were treated with a 20 x normal concentration of diazinon for mange.

Carbamates

In the Soutpansberg district of Northern and Eastern Transvaal Region, 5 cattle died and another 14 were clinically affected after malicious poisoning.

Temik caused the death of 15 cattle, 12 impala, 8 bushbuck, 3 jackal and 1 baboon in 3 cases of malicious poisoning.

Carbamate used in bait for jackal caused 1 bovine death and 1 clinically affected as well as 1 oryx affected in the Free State Region.

Chlorinated hydrocarbons

Eastern Cape and Karoo Region reported the death of 2 dogs due to gamma-BHC and Western Cape the death of 1 bovine and 1 animal clinically affected.

In the Western Cape Region, 2 sheep died, with another 7 clinically affected due to [hiodan poisoning.

Strychnine

The following mortalities in dogs, mostly due to malicious poisoning, were reported by the various regions: Northern and East Transvaal 3; Highveld 3; OFS 3: Natal 1: Eastern Cape and Karoo 4; and Western Cape 2.

Arsenic

In the Transvaal Region, deaths were recorded where a mono-sodium-arsenate containing compound was used on natural grazing to eradicate prickly pear. Cattle started grazing the treated camp 3 weeks later and in another 10 days, 20 animals died due to confirmed arsenic poisoning. An unknown number of impala also died. The same compound led to the death of 45 cattle in the Eastern Cape and Karoo Region.

Eastern Cape and Karoo Region also reported 28/ 200 fatalities in cattle where an old arsenic container was washed open and cattle then obtained access to it.
In the Northern and Eastern Transvaal Region, 20 cattle died due to arsenic poisoning; in the Highveld Region 2 calves died, in Natal 2 cattle died and in the Western Cape Region 1 dog and 6 cattle died.

Cyanide

In a case of malicious poisoning by “muti” traders in the Kruger National Park, the following animals died: 48 vultures, 2 tawny eagles, 1 bateleur eagle and 1 hyena. Cyanide was used in conjunction with Diazothion.

Highveld Region reported the death of 2 cattle due to cyanide poisoning and also of an unknown number of sheep in the vicinity of Oberholzer after drinking waste water from a mine.

Coumarin derivatives

Rat poison killed 3 dogs and affected another clinically in the Eastern Cape and Karoo Region.

Lead

Highveld Region reported the death of 1 bovine with a further 3 affected after consuming battery plates. In the Natal Region, 16 cattle deaths were reported as a result of this heavy-metal poisoning.

Iron

Acute deaths in piglets were reported by the Northern and Eastern Transvaal Region after overdosage with iron dextran injections.

Copper

Free State Region reported the death of 3 lambs with 1 clinically affected out of 12 and Western Cape Region reported 17 sheep dead and 7 sick. In the Eastern Cape and Karoo Region 19 sheep died due to chronic copper poisoning.

In the Thabazimbi district of the Transvaal Region, 5/36 sheep died due to acute copper poisoning after lambs were treated with a copper-containing fungicide. Three months later, a further 5 sheep died due to chronic copper poisoning.

Fluoride

A suspected case of fluoride poisoning was reported by the Highveld Region in the Parys vicinity; 40/60 cattle were involved.

Nitrate

Northern and Eastern Transvaal Region reported 38 fatalities in cattle from the Barberton vicinity. Natal Region reported 5 deaths in sheep and Eastern Cape and Karoo Region 6 mortalities in sheep due to nitrate poisoning.

Urea

This crude protein supplement for ruminants again caused many deaths. In most cases
animals overconsumed or drank the fluid containing high levels of urea after rain had fallen on licks.

Transvaal Region reported 8 outbreaks of which 4 were in sheep (48/616 died), 3 in cattle (5/409 died) and 1 in goats (1/7 died). In the latter instance the goats gained access to a fertiliser store.

Highveld Region reported 1/60 cows and 1 pig dying of urea poisoning. In the Free State Region 3 outbreaks in cattle killed 18/154 animals; 1 outbreak in sheep killed 32/61 animals and 1 springbok died.

Eastern Cape and Karoo Region reported the mortality of 25 sheep and Western Cape 12 cattle, 8 pigs and 21 sheep, due to urea poisoning.

*Ammonia*

An instance of respiratory distress and nose rubbing in rabbits was reported by the Eastern Cape and Karoo Region. These symptoms were due to a high concentration of ammonia vapour in the rabbit hutches.

Western Cape Region reported 4 cattle deaths with another 10 clinically affected as a result of the injudicious use of ammonia-treated roughage.

*Salt*

Two outbreaks of salt poisoning in chickens were reported by the Northern and Eastern Transvaal Region with 16 mortalities in one case and 2000/4000 in the other.

Highveld Region reported 5 chicken deaths and the Western Cape Region 30/300 sheep mortalities, due to salt poisoning.

*Ammonium chloride*

After injudicious use of this salt for the control of urolithiasis in rams, 2/15 mortalities were reported by the Western Cape Region.

*Anthelmintics*

As a result of overdosing 2 sheep died in the Northern and Eastern Transvaal Region while Highveld Region reported a case where 2 sheep became permanently blind as a result of overdosing with a closantef-containing remedy.

*Ionophores*

These substances are commonly used in rations of ruminants for the control of coccidiosis and as a growth promoter.

Highveld Region reported the death of 5 calves that had chicken litter included in their ration.

Free State Region reported the death of 5 rams when they consumed a commercial sheep feedlot ration containing an excessively high level (45 ppm) of salinomycin.

In another instance 15/100 Angora goats were also killed by excessive salinomycin intake and 5/150 bulls due to excessive intake of monensin.

In the Western Cape Region, ionophore poisoning was proved to be the cause of death of 25 sheep, 26 cattle and 1 horse.

*Plant poisoning*
TRANSVAAL REGION

Plants

Tulip - 7 outbreaks reported (Standerton 6 and Piet Retief 1), with 16/1 020 cattle dead.
Lantana - 4 outbreaks from the bushveld area reported with 31 / 460 cattle and 10/100 sheep dying.
Seneciosis - 2 outbreaks reported with mortalities in 26/450 cattle in the Vrede district and 1 bovine death with a further 2 sick in the Piet Retief area.
Gousiekte - 1 outbreak reported from Ermelo area with 6/90 sheep dying. Cases were confirmed histopathologically.
Slangkop - 1 outbreak was reported from the Rustenburg area with 4 cattle dying and 7 sheep clinically affected, but which recovered after treatment.
Syringa berries - 1 outbreak reported from Rustenburg area with 2 pigs dying and another 6 sick.
Gifblaar - only 1 outbreak in which 3 cattle died was reported from the Rustenburg area.
Datura - 1 outbreak reported from the Piet Retief area with 2/95 sheep affected. They subsequently recovered.
Prussic acid poisoning - 3 outbreaks reported from the Rustenburg and Piet Retief areas with 1/1 344 sheep and 4/19 cattle dying.
Photosensitivity - 1 outbreak reported from the Rustenburg area with 3/23 goats showing symptoms. The cause was unknown.

Toxins

Aspergillus clavatus - 1 outbreak in the Thabazimbi district was recorded, with 25/35 cattle dying over a 3-week period as a result of the growth of the fungus in the feed which was wet when pelleted. Nervous symptoms developed 1 to 2 weeks after the initial intake of feed. Brewers grain residue (maroek) was not used in the food, but sorghum had been.
Diplodiosis - 10 outbreaks were recorded (Standerton 7; Piet Retief 2 and Ermelo 1) in sheep that were grazing harvested maize lands. In total, 111 animals died and another 139 were clinically affected out of a total of 7 579.
Microcystis spp. - 1 outbreak due to M. aeruginosa reported from the Ermelo area with 2/50 cattle dying after drinking pan water. One outbreak of M. toxica reported from the Standerton area with 5/90 sheep dying after drinking water from the Vaal Dam.
Tick toxicosis - 2 outbreaks of spring paralysis in lambs reported with 30/ 550 sheep involved. One outbreak reported in the Frankfort vicinity; 4 young cattle died.

NORTH AND EASTERN TRANSVAAL

Plants

Tulip - 6 cattle died; lantana - 77 cattle died and 35 sick; seneciosis - 17 cattle, 36 sheep, 9 goats, 1 horse and 1 mule died; gousiekte - Pavetta spp. - 5 sheep and 6 cattle died; Fadogia spp. - 3 sheep and 2 cattle died; gifblaar - 3 cattle died; prussic acid - 13 cattle and 6 sheep died; Nerium oleander - 3 cattle affected; chinkerinchee - Ornithogalum spp. - 20 sheep died; Solanum kwebense - 6 sheep died; Tribulus spp. - 1 sheep died, and Sarcosteinma viminale - 4 cattle died.
Toxins

Diplodiosis - 37 cattle and 33 sheep died; photosensitivity - 80 % of a flock of lie de France sheep developed symptoms and 5 lambs died on Panicum schinzii pasture in the Waterberg.

HIGHVELD REGION

Plants

Slangkop (Urginea sanguinea) - I Angora goat died and 3 sheep were clinically affected, of which 2 died, and gousiekte (Pachystigma pygmaeum) - 10 sheep affected out of 50: 6 died.

Toxin

From feed that caused diarrhoea in calves, Fusiform is, Aspergillus and Penicillium spp. were isolated. Fusarium moniliforme caused the death of 9/18 horses with acute nervous symptoms. A foal was also affected through the milk of the mare.

FREE STATE REGION

Plants

Geeldikkop - 20 outbreaks were reported in sheep and Angora goats involving 279 cases of which 192 died; facial eczema - II outbreaks in sheep with 84 cases. These cases were especially prevalent in the Fauresmith area. Prussic acid poisoning - 15 outbreaks with 122 cases; vermeersiekte - 4 outbreaks (2 suspect) with 10 cases in sheep; tulip poisoning - 16 outbreaks with 105 cases; slangkop -8 outbreaks with 232 cases. In 1 outbreak, 200 sheep died in the Upington vicinity as a result of Ornithoglossum ~iridae. Krimpsiekte - 2 outbreaks with 7/308 mortalities: Crotolaria sparthioides -14/127 cattle died in the Kuruman area.

Isolated cases of the following poisonings were reported: Gnidia polvcephala; Hertia pallens and Argemone spp.

NATAL REGION

Plants

Prussic acid poisoning - 10 sheep and 14 cattle died; Seneciosis - 7 cattle. 117 sheep and I horse died, tulip poisoning - 74 cattle and 6 sheep died and lantana - 46 cattle died.

EASTERN CAPE AND KAROO REGION

Plants

Tribulus terrestris - 914 cases in sheep; Dipcadi ciliare - 67 Angoras died; Thesium spp. - 41 Angora goats died; Urginea spp. - 10 Angora goats died; prussic acid poisoning - 25 cattle and 15 goats died; Salsola tuberculata - 3 sheep ewes affected; seneciosis - 31 sheep, 6 goats and 3 cattle died. Many cases were not reported. Ganskweek - 3 cattle affected; kikuyu - 19 cattle died; Cynanchum spp. -9 cattle and 20 goats died, and Helichrvmus spp. - 5/36 cows developed blindness.
Toxins

*Microcystis toxica* - 2 cattle died; mouldy wheat — 10 cattle died.

WESTERN CAPE REGION
Plants

Prussic acid poisoning - 219 sheep, 76 goats and 11 cattle died; *Ornithogalum* spp. (chinkerinchee) – 8 sheep died; *Cot i'ledon* spp. - 410 sheep, 24 goats and 8 calves died; *Galenia africana* - 41 sheep died; *Salsola* spp. - 153 sheep died; tulip (*Moraea* spp.) - 44 sheep, 8 goats and 33 cattle died. 104 cattle affected. *Athanasia tr-furcata* - 18 sheep died and 13 affected; *Argemone* spp. - 18 sheep died; *Boophane disticha* - 2 sheep died; *Hi'aenanche globosa* - 10 sheep died; *Cvnan chum* spp. - 4 cattle and 3 sheep died with 12 cattle and 2 more sheep affected; *Gnidia burchelli* - 8 sheep died.

Sporadic cases of other plant poisonings reported included such plants as: acorns; wild mustard; *Anagallis arvensis*.

Toxins

Aflatoxin - very mouldy maize caused a severe diarrhoea in 600 weaner pigs; mouldy silage - 5/30 calves died, and ryegrass - 6 cattle and 1 sheep died.

INTERNAL PARASITES

Roundworms

A significant increase in problems associated with roundworm infestations occurred since last year. After the good rains most regions reported an increased incidence of *Haemonchus* spp. infestation. Mortalities were mainly reported in the summer rainfall areas.

Northern and Eastern Transvaal Region reported that *Cooperia* spp. and *Qesophagostomum* spp. were especially prevalent in the Lowveld. Nodular worm also occurred sporadically in the Free State Region.

The most important roundworm species found in the Eastern Cape and Karoo Region were *Haemonchus* spp., *Nematodirus* spp. (especially in the Karoo). *Ostertagia* spp. and *Trichostrongylus* spp. The same species were also reported as important in the Western Cape Region, with *Dictyocaulus* spp. also responsible for the condemnation of sheep lungs in the region.

Flukes

*Paramphisiomuin* (conical fluke) and *Fasciola* spp. (liver fluke) were reported regularly from the higher rainfall areas of the country, especially where animals grazed irrigated pastures.

Tapeworms

*Moniezia* spp. and *Avittelina* spp. infestations were commonly reported. A fair number of *Thysaniezia* spp. infestations in lambs were also reported from the Eastern Cape and Karoo Region.

*Coenurus cerebralis* also caused many cases of “turning disease” in the same Region.

Measles again was responsible for many condemnations of cattle and pig carcases at abattoirs.
The Transvaal Region reports an incidence of 2.81% of measles in cattle slaughtered at 4 abattoirs in the Rustenburg SV area and an incidence of 0.47% in pigs slaughtered. Northern and Eastern Transvaal Region reported an average incidence of 2.9% of measles in pigs slaughtered in the Region.

Highveld Region reported the condemnation of 657 pig carcases and the freezing of 33 carcases as a result of measles in 239 consignments.

From the Western Cape Region, it was reported that 30 cattle carcases were condemned due to measles.

*Stilesia hepatica* resulted in the condemnation of thousands of sheep livers in the Eastern Cape and Karoo Region as well as the Western Cape Region. The latter Region also reported the common occurrence of *Echinococcus* that also led to liver condemnations.

*Sarcosporidia* cysts were still regularly seen in game slaughtered in the Northern and Eastern Transvaal Region.

**EXTERNAL PARASITES**

**TRANS VAAL REGION**

The blue tick (*Boophilus* spp.) occurred most commonly. *Rhipicephalus* spp. caused spring paralysis in 53/850 reported cases. *Hyalomma* spp. in small stock seems to be increasing in the Rustenburg area.

*Damalinia ovis* was also found in 2 flocks with 167/167 cases in sheep in the Ermelo area and in Angora goats in the Vrede district.

In the Amersfoort district, an unidentified mite affected the faces of sheep and gave rise to the development of crusts on the face and lips.

Parafilariosis was reported from the Thabazimbi district in 3 outbreaks with 27/843 cattle clinically affected.

**NORTHERN AND EASTERN TRANSVAAL REGION**

A dramatic decrease in the tick population occurred in the north-western areas of the region due to drought conditions and this gave rise to an unstable situation with regard to heartwater immunity.

Lice caused problems in cattle in the Pilgrim’s Rest district (15/15 cases) and in Angora goats in the Lydenburg district.

Sarcoptic mange was reported in various wild species, and in 4 cattle herds in the Lydenburg and Belfast districts.

**HIGHVELD REGION**

*Damalinia ovis* was reported in 2 flocks of sheep in the region, with 265 cases.

**FREE STATE REGION**

About 185 animals were affected by Australian itch mite in 2 outbreaks.

The Karoo paralysis tick is a major problem in the Bloemfontein and Fauresmith areas. In sheep, 13 outbreaks (4 dead, 33 affected), in Angora goats 3 outbreaks (22 dead, 13 affected) and in game (especially reedbuck and oryx) outbreaks were reported.

Bontlegged ticks are commonly reported with resultant abscessation and lameness.
in small stock.
In the Upington area, severe infestation with blue louse and red-head louse in Dorper sheep was seen in the middle of a dry summer.

EASTERN CAPE AND KAROO REGION

Blue tick was reported as the most common tick on stock.
Isolated outbreaks of paralysis due to *Rhipicephalus evertsi* were reported from the Queenstown area with 5 cows, 3 calves and 7 Boer goats dying. Paralysis as a result of *Ixodes rubicundus* was also reported from the Beaufort West and Middelburg State veterinarian areas. Blow-fly strikes caused severe problems in this region.

WESTERN CAPE REGION

*Rhipicephalus* spp. is apparently spreading further from the south to the west coast.
*Ambivorma* spp., which for many years was confined to a small area between the Small and Great Brak Rivers in the Mossel Bay vicinity, has now spread to the west of Mossel Bay.
As a result of the slackening of compulsory dipping, *Psorergates ovis*, the sheep itch-mite, now again occurs along the south coast of the Cape.
*Otobius megnini* occurs commonly in the George, Oudtshoorn and Uniondale districts.
Blow-fly strikes occurred mainly in the summer months, but cases were even seen during the winter months.

*Cattle mange*

Thirteen outbreaks of cattle mange (*Psoroptes*) occurred with 202/1,511 cases. Good results were obtained with the simultaneous treatment of oral ivermectin and topical diazinon.

ARTIFICIAL INSEMINATION

The Al and Reproduction Section (OP), the veterinary laboratories and State veterinarians were again involved in the testing, registration and re-registration of bulls belonging to the Taurus Al Co-operative. Of the 350 bulls at these Al stations, 61 were proven dairy breed bulls and 50 performance tested beef breed bulls. A total of 317 were dealt with - 69 for registration and 248 for re-registration.
Countrywide, 712,557 doses of cattle semen were sold by Taurus (597,339 doses of dairy breeds and 115,218 doses of beef breeds); 898,666 doses of semen were produced.
Semen was also collected from 557 bulls in private ownership for use by their owners.
The Al section (OP) also examined 4,312 semen straws from both registered and private bulls. No bacterial growth could be obtained from 69% of these straws while 21.5% had between 1 and 9,999 colonies and 9.5% had more than 10,000 colonies.
The Al section (OP) and various State veterinarians were involved in presenting a number of Al courses both for cattle and sheep.
Table 22 reflects these activities.
Taurus also conducted 111 courses for Whites,
TABLE 22. Artificial insemination courses (cattle) presented by the Directorate

<table>
<thead>
<tr>
<th>Region</th>
<th>Registered inseminators course</th>
<th>Owners course</th>
<th>Labourers course</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Courses Passed</td>
<td>Courses Passed</td>
<td>Courses Passed</td>
</tr>
<tr>
<td>Transvaal</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>N and E Transvaal</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Highveld</td>
<td>1 7</td>
<td>10 119</td>
<td>1 5</td>
</tr>
<tr>
<td>OFS</td>
<td>-</td>
<td>2 49</td>
<td>-</td>
</tr>
<tr>
<td>Natal</td>
<td>-</td>
<td>1 23</td>
<td>22 191</td>
</tr>
<tr>
<td>Eastern Cape</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Western Cape</td>
<td>2 37</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>AI Section</td>
<td>3 39</td>
<td>1 16</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>6 83</td>
<td>23 207</td>
<td>23 196</td>
</tr>
</tbody>
</table>

78 for Blacks and 6 for Coloureds, during which 1 564 people were trained.

The Boskop Training Centre of the SA Agricultural Union also conducted 14 courses with 101 students attending.

The Donkerhoek Al Station applied to register 10 rams as semen donors. Of these, 9 were registered during the year and 1 was rejected because of poor semen motility. The Taurus Centre at Durbanville only prepared ram semen for private owners for their own use. Application has been made to have this Centre registered for keeping rams permanently and to sell semen from 1 April 1988.

One sheep Al course was presented by the State veterinarian at Bloemfontein with 12 people attending. A further 53 students at Grootfontein College of Agriculture were also trained in this technique by officers assisted by personnel of Taurus.

STOCK INSPECTION SERVICES

The increased involvement of stock inspection staff in the Tuberculosis and Brucellosis Schemes filled a gap that was created with the change in their duties. In some regions the setting of objectives and keeping records of achievements in a graphic form resulted in improved productivity.

Consultations were initiated for the creation of a course for officials to qualify them as animal health technicians. There is much enthusiasm for such a course and it is anticipated that it will be initiated in 1991.

Table 23 reflects the situation regarding the posts of Stock Inspectors.

It is clear that serious problems exist in specific regions. Various services suffer and especially disease reporting, liaison and extension are suffering.

TABLE 23. Stock inspectors - 1987/88

<table>
<thead>
<tr>
<th>Region</th>
<th>Posts</th>
<th>Filled</th>
<th>Vacant</th>
<th>% Vacant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transvaal</td>
<td>72</td>
<td>63</td>
<td>2</td>
<td>12.5</td>
</tr>
<tr>
<td>N. and E. Transvaal</td>
<td>67</td>
<td>59</td>
<td>2</td>
<td>12.0</td>
</tr>
<tr>
<td>Highveld</td>
<td>61</td>
<td>41</td>
<td>20</td>
<td>33.0</td>
</tr>
<tr>
<td>OFS</td>
<td>54</td>
<td>51</td>
<td>3</td>
<td>5.5</td>
</tr>
<tr>
<td>Natal</td>
<td>68</td>
<td>42</td>
<td>26</td>
<td>38.0</td>
</tr>
<tr>
<td>Eastern Cape and Karoo</td>
<td>43</td>
<td>34</td>
<td>9</td>
<td>21.0</td>
</tr>
<tr>
<td>Western Cape</td>
<td>30</td>
<td>30</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Total</td>
<td>395</td>
<td>320</td>
<td>75</td>
<td>Ave:17.4</td>
</tr>
</tbody>
</table>

ANIMAL HEALTH EXTENSION SERVICES

Since the prevention of diseases has a high priority, concerted efforts were made to keep the animal industry informed of all important developments.

State veterinarians were closely associated with organised agriculture and many meetings of farmers’ associations and agricultural unions were attended and addressed. Many State veterinarians are also members of study groups in their areas and made important contributions.

State veterinarians also made better use of the media by placing reports regarding disease control and prevention in local newspapers.

Information leaflets covering a variety of subjects were compiled by State veterinarians for distribution amongst farmers.

Since inspection personnel of the Directorate had contact with farmers on a regular basis, they acted as important mediators in disseminating information. In-service training for these officers highlighted various aspects of extension.

TRAINING

Training was identified as one of the major factors affecting the Department negatively. This gave rise to a committee which investigated the situation regarding training.

A refresher course for State veterinarians was held for the first time in the year under review. The course took the form of a workshop with free exchange of opinions. The course was attended by 24 State veterinarians.

A workshop for Principal Stock Inspectors was also held during which 14 officers freely exchanged ideas in respect of their duties.

Eight workshops were held in the various Regions in an attempt to improve productivity and to solve problems.

Stock Inspection training courses continued. Intensive training was given to 22 officers over a 4-week period in Pretoria. During 2 training courses, 60 officers were trained to perform tuberculosis tests.

Various courses presented by this Department and the Commission for Administration were attended by officers. These courses included orientation courses, junior management courses, a legal course, a communication course (participative management) and an institutional strategy planning course.

Various courses, workshops and symposiums attended by officers included a worm resistance workshop; sheep workshop; tick toxicosis workshop, and the South African Veterinary Association congress and various mini congresses.

The Directorate also provided training in Veterinary Law and Ethics to final year veterinary students at State veterinary offices and laboratories. Officials gave lectures on the above subject to students at the Faculty of Veterinary Science at the University of Pretoria and Medunsa.

At the various agricultural colleges, State veterinarians presented lectures to students and set examinations.

LEGISLATION

Only one amendment of the Animal Disease Regulations, promulgated in accordance with the Animal Diseases Act, 1984 (Act No. 35 of 1984), was made, namely that both blue and black wildebeest are subject to the same movement restrictions as buffalo, warthog, bushpig and wild pig (No. R.884 of 5 May 1988).
TECHNICAL LIAISON WITH OTHER COUNTRIES

Africa

Officers were again involved in the 6-monthly meetings of SECOSAF, the Secretariat for Multilateral Co-operation of the SATBVC countries. Disease control measures and the training of stock inspection personnel were discussed during these meetings.

The annual meeting of SARCCUS was also attended and co-ordination in respect of animal disease control measures was discussed with delegates from Botswana, Swaziland, Lesotho, Malawi and South-West Africa/ Namibia.

Locally liaison was maintained with neighbouring countries on various border commissions and border control workgroups.

Overseas countries

Dr J.M. Erasmus and dr P.P. Bosman visited Europe. The annual meeting of the OIE was attended and dr Bosman undertook a study tour in respect of laboratory services in Europe.

The State veterinarian at Skukuza presented a paper to the Safari Club International in Los Angeles, at the invitation of SATOUR, on the anatomy of large game.

The State veterinarian in Pretoria was involved in a project concerning indigenous cattle on Grand Comores Island and visited this island on three occasions during the year under review.

Mr G.C. Bishop, Allerton RVL, visited various veterinary research institutes and diagnostic laboratories in Holland, Belgium, Scotland and England.

Dr J.P. Kitching, Allerton RVL, visited the Animal Disease Research Centre and the Veterinary Services Laboratory in the United States of America. He also attended the 2nd meeting of The Codex Committee on Residues of Veterinary Drugs in Foodstuffs.

CLINICAL AND DIAGNOSTIC SERVICES

Clinical services were rendered by State veterinarians to private institutions where time permitted and private veterinarians were not available.

The following fees were collected and paid into treasury:

<table>
<thead>
<tr>
<th>Professional fees and vaccine sales</th>
<th>R 48 997</th>
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<tbody>
<tr>
<td>Travelling fees</td>
<td>R 22 740</td>
</tr>
<tr>
<td>Laboratory fees</td>
<td>R 179 017</td>
</tr>
<tr>
<td>Quarantine fees</td>
<td>R 267 195</td>
</tr>
<tr>
<td>Diverse</td>
<td>R 66 760</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>R 584 709</strong></td>
</tr>
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A summary of laboratory diagnostic services delivered by Veterinary Regional Laboratories and Veterinary Laboratories is given in Table 24.
<table>
<thead>
<tr>
<th>Bovine brucellosis</th>
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<tr>
<td>Rose Bengal plate agglutination tests</td>
<td>1 246 227</td>
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<tr>
<td>Complement fixation tests</td>
<td>11 737</td>
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<tr>
<td>Serum agglutination tests</td>
<td>6 051</td>
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<tr>
<td>Milk-ring tests</td>
<td>32 297</td>
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<tr>
<td>Other tests</td>
<td></td>
</tr>
<tr>
<td>Dourine complement fixation tests</td>
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<tr>
<td>Other complement fixation tests</td>
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<tr>
<td>Leptospirosis</td>
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<tr>
<td><em>Brucella ovis</em></td>
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<td><em>Brucella melitensis</em></td>
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<td><em>Brucella abortus</em></td>
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<td><em>Actinobacillus serumis</em></td>
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<td><em>Coxiella burnetti</em></td>
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<td>Other CF tests</td>
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<td>Serum virus neutralisation</td>
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<td>Serum gel immuno diffusion tests</td>
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<td>Haemagglutination inhibition tests</td>
<td>28 824</td>
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<td>Serotyping of cultures</td>
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<table>
<thead>
<tr>
<th>Diagnostic smears</th>
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<tr>
<td>FA smears</td>
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<tr>
<td>Blood smears</td>
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<tr>
<td>Spleen smears</td>
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<tr>
<td>Brain smears</td>
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<td>Procine faeces smears</td>
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<tr>
<td>Bovine faeces smears</td>
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<tr>
<td>Impression smears</td>
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<tr>
<td>Semen smears</td>
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<td>Lochia smears</td>
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<tr>
<td>Bacterial specimens examined (cultures)</td>
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<td>Antibiograms</td>
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<tr>
<td>Mycological specimens examined</td>
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<tr>
<td>Mycoplasma and ureaplasma</td>
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<tr>
<td>Biological tests done</td>
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<td>Histopathological sections</td>
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<td>Reproduction</td>
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<td>Semen quality tests</td>
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<td>Sheath washes: vibriosis</td>
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<thead>
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<th>Serology</th>
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<tr>
<td>Trichomoniasis</td>
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<tr>
<td>Vaginal swabs</td>
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<td>Abortedfoetuses</td>
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<tr>
<td>Placentas examined</td>
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<tr>
<td>Uteri examined</td>
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| Mastitis |  |
Somatic cell count 115029
Biochemical tests 45826
Toxicological tests 1180
**Dip specimens tested**
Haematological tests 110
Faecal samples examined 10061
**Egg count** 12835
Larval cultures 486
Identification of internal parasites 4694
Identification of external parasites 387
Identification of plants 92
Abattoir by-products 176
Abattoir hygiene – bacterial counts 597
Bacterial counts 5988
Antibiotic residues 203
Vaccine produced 51552
Reagents prepared 6249
Media prepared 121044
Reagents and stains 296983
Clinical examinations 18887
**Post-mortem examinations**
Poultry 6963
Other animals 4586
Fish 261

**IMPORT AND EXPORT CONTROL**

A large variety of animals and animal products was imported into the Republic from all over the world. To protect the animal population of the RSA, strict requirements were laid down for these animals and products to comply with. To ensure that these requirements were met with, imported animals were kept in quarantine for prescribed periods at stations at Jan Smuts airport, Cape Town, Durban and Walvis Bay harbours. Further tests were done on these animals or they were subjected to treatment during this quarantine period.

To prevent the illegal movement of animals or products across the borders of the RSA, these borders were constantly patrolled by officers of the Directorate. When cases of illegal entry were detected, the animals or products were confiscated and destroyed, slaughtered or returned to the country of origin.

Animals or animal products for export were tested or treated according to the prescribed standards of the import country. Health certificates were issued as soon as all the requirements of the import country had been complied with.

Tables 25 to 30 reflect the statistics in respect of movement of animals or animal products across the country’s borders

| TABLE 25. Animals imported from neighbouring countries |
|---------------------------------|---|---|---|---|---|---|---|---|---|---|
| **Country** | **Cattle** | **Sheep** | **Goats** | **Horses** | **Pigs** | **Dogs** | **Cats** | **Birds** | **Game** | **Poultry** |
| Zimbabwe | 3 | - | - | 10 | - | 187 | 77 | 1505 | 128 | - |
| Mozambique | - | - | 1 | - | - | 4 | 1 | - | - | - |
| SWA | 18025 | 25666 | 9405 | - | - | 3 | - | 10 | 142 | - |
| Botswana | 2 | 1 | - | - | - | 6 | 8 | 1 | III | 22 |
| Lesotho | - | - | - | 1 | - | 4 | - | - | - | - |
| Swaziland | 4955 | - | 59 | 18 | - | - | 5 | 200 | - | - |
| Bophuthatswana | 210 | - | - | - | - | - | - | 182 | - | - |

30
<table>
<thead>
<tr>
<th></th>
<th>Venda</th>
<th>Malawi</th>
<th>Transkei</th>
<th>Ciskei</th>
<th>Zambia</th>
<th>Lebowa</th>
<th>Total</th>
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<td>1</td>
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<td>-</td>
<td>-</td>
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<table>
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<tr>
<th>Total</th>
<th>30654</th>
<th>25744</th>
<th>9490</th>
<th>171</th>
<th>25204</th>
<th>87</th>
<th>1804</th>
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</thead>
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<tr>
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<td>25744</td>
<td>9490</td>
<td>171</td>
<td>25204</td>
<td>87</td>
<td>1804</td>
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TABLE 26. Imports of animals from overseas Neighbouring states and Overseas Total

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<th>Neighbouring states</th>
<th>Overseas</th>
<th>Total</th>
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<td>30755</td>
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<td>25764</td>
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<td>-</td>
<td>9490</td>
</tr>
<tr>
<td>Horses</td>
<td>171</td>
<td>241</td>
<td>412</td>
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<tr>
<td>Pigs</td>
<td>25</td>
<td>5</td>
<td>30</td>
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<tr>
<td>Dogs</td>
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<td>1174</td>
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<td>Cats</td>
<td>87</td>
<td>340</td>
<td>427</td>
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<td>Birds</td>
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<tr>
<td>Game</td>
<td>763</td>
<td>90</td>
<td>853</td>
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<td>Primates</td>
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<td>19</td>
<td>38</td>
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TABLE 27. Import of animal products from neighbouring countries and overseas

<table>
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<th>Product</th>
<th>Quantity</th>
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<tr>
<td>Horns and hoofs (kg)</td>
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<tr>
<td>Hides and skins (kg)</td>
<td>4543 549</td>
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<tr>
<td>Hides and skins (pieces)</td>
<td>1151 636</td>
</tr>
<tr>
<td>Hair/pig hair/feathers (kg)</td>
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<tr>
<td>Wool and furs (kg)</td>
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<tr>
<td>Carcass and bonemeal (kg)</td>
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<tr>
<td>Burlap pieces (kg)</td>
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<tr>
<td>Serum (flasks)</td>
<td>2 185</td>
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<tr>
<td>Vaccines (doses)</td>
<td>820 221 682</td>
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<tr>
<td><strong>Blood samples</strong></td>
<td><strong>3 276</strong></td>
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<tr>
<td>Animal feeds (kg)</td>
<td>10729 227</td>
</tr>
<tr>
<td>Meat: poultry (kg)</td>
<td>11 254 877</td>
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<tr>
<td>red meat (kg)</td>
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<tr>
<td><strong>Liver powder (kg)</strong></td>
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<tr>
<td>Semen (straws)</td>
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<tr>
<td>Embryos</td>
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<tr>
<td><strong>SPF Eggs</strong></td>
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</tr>
<tr>
<td>Trout ova (ova)</td>
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<tr>
<td>Trophies</td>
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<td>Casein/butter/whey/cheese/milk powder (kg)</td>
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TABLE 28. Exports of animals to neighbouring countries

<table>
<thead>
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<th>Country</th>
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<th>Goats</th>
<th>Horses</th>
<th>Pigs</th>
<th>Donkeys</th>
<th>Cats</th>
<th>Birds</th>
<th>Game</th>
<th>Rats</th>
<th>Hamsters</th>
<th>Rabbits</th>
<th>Pri mates</th>
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<td>115</td>
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TABLE 29. Export of animals to neighbouring states and Table 29 (continued) overseas

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<th>Overseas States</th>
<th>Total</th>
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TABLE 30. Stock numbers for the Republic and the self-governing states

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<th>Region</th>
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<th>Goats</th>
<th>Horses Donkeys/mules</th>
<th>Pigs</th>
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<td>194974</td>
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30
INTRODUCTION
The Subdirectorate: Meat Hygiene is responsible for the administration of the Animal Slaughter, Meat and Animal Products Hygiene Act, 1967 (Act No. 87 of 1967). Since the Act came into force in 1970, very good progress has been made with realising the objective thereof. This Act provides for:

- Maintaining proper standards of hygiene when slaughtering animals and handling meat and animal products.
- Preventing the transmission of diseases to people and animals, meat and animal products.
- The prevention of maltreatment when slaughtering animals at abattoirs.
- Control over the importation of certain meat.
- Additional matters relating to the above.

The subdirectorate also supported the Government policy of deregulation and privatisation in the enforcement of the Act.

ABATTOIRS
The Standing Regulations under the Act make provision for minimum hygiene standards at abattoirs. By the end of the year under review 82.5% of the animals were slaughtered at red meat abattoirs complying with the regulations of the Act.

Good progress has been made at the abattoirs that do not yet comply with the requirements. Planning for improvement at these abattoirs or replacement by new abattoirs is already in an advanced stage at 58% of these abattoirs, while the other 42% are under construction according to plans that are, from a hygiene point of view, acceptable to the Subdirectorate.

![Graph of Ownership of red-meat abattoirs, 1986 and 1987](image)

**FIG. 1. Ownership of red-meat abattoirs, 1986 and 1987**

Poultry abattoirs are all privately owned and the number increased by 14 (10%) during the past year.

There are 8 rabbit abattoirs in the Republic. Two such abattoirs closed during the year while 2 new ones were opened. All the rabbit abattoirs are privately owned.

The number of abattoirs in the self-governing territories is unknown. Certificates of approval are issued to these abattoirs by the veterinary authority concerned. Policy decisions and law enforcement remain under own affairs in these areas.
Table 1. Number of abattoirs in white areas on 31 March 1988

<table>
<thead>
<tr>
<th>Type of abattoir</th>
<th>1983</th>
<th>1987</th>
<th>1988</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red meat</td>
<td>481</td>
<td>287</td>
<td>283</td>
</tr>
<tr>
<td>Poultry</td>
<td>191</td>
<td>148</td>
<td>162</td>
</tr>
<tr>
<td>Rabbit</td>
<td>9</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>681</td>
<td>443</td>
<td>453</td>
</tr>
</tbody>
</table>

TABLE 2. Grading of red meat abattoirs and percentage of animals slaughtered 1987-1988

<table>
<thead>
<tr>
<th>Grade of abattoir</th>
<th>Number of abattoirs</th>
<th>% slaughtered</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>29</td>
<td>80,1</td>
</tr>
<tr>
<td>B</td>
<td>16</td>
<td>7,5</td>
</tr>
<tr>
<td>C</td>
<td>32</td>
<td>6,7</td>
</tr>
<tr>
<td>D</td>
<td>56</td>
<td>3,7</td>
</tr>
<tr>
<td>E</td>
<td>150</td>
<td>2,0</td>
</tr>
<tr>
<td>Total</td>
<td>283</td>
<td>100,00</td>
</tr>
</tbody>
</table>

New abattoirs erected

One grade D and 9 grade E red-meat abattoirs were erected by private owners during the year under review, while 24 new poultry abattoirs were erected by private owners in the same period.

Improved abattoirs

Good progress has been made with the existing abattoirs to comply with all the structural requirements in regard to hygiene. During the year 35 improvement projects were completed at red-meat abattoirs and 12 at poultry abattoirs.

Abattoir planning

Section 18 of the Act authorises the Chief Meat Hygiene Officer to compile specifications and codes for the hygiene management in abattoirs, to obtain information on the design, planning, construction and management of abattoirs and to advise abattoir owners on these subjects.

Before an abattoir building project may commence, the plans are first evaluated by the staff of the Subdirectorate: Meat Hygiene to ensure that they are acceptable from a hygiene point of view. Abattoir owners and consultants are also provided with technical advice during the planning stage.

Three-hundred-and-nine sets of plans were evaluated during the year under review, 151 of which were new and 158 of which were improvement projects. Discussions were held 465 times with abattoir owners and consultants for this purpose. Regional officers carried out 203 inspections to monitor projects under construction.

To facilitate the advisory and plan evaluation service for abattoir owners and consultants, this function was decentralised to the regional offices as far as Grade C, D and E abattoirs are concerned.

An investigation into the basis of abattoir grading requirements was completed during the year.
Some of the most important findings were that the facilities provided at abattoirs had improved drastically over the past 10 years. The maximum allowable daily throughput in some abattoirs has also been increased, without detrimental effect to the maintenance of hygiene. Proposed grading amendments have been drawn up on the basis of these findings and submitted for comment to interested people and bodies.

The Steering Committee for the Evaluation of Abattoir Equipment was established on the recommendation of the Subdirectorate. This Committee will be of assistance to both the manufacturers and the users of the equipment.

Abattoirs exempted from the application of the Act

Section 42 (1) stipulates that the Minister can exempt certain abattoirs from the provisions of the Act by a notice in the Government Gazette. These exemptions are granted only in exceptional cases. Only 3 abattoirs were given such exemptions during the year under review.

Abattoirs closed

During the year 11 red meat and 10 poultry abattoirs closed because they did not comply with the structural requirements or because new slaughter facilities were provided.

The present situation of red-meat abattoirs in respect of structural requirements

Through the judicious application of the Act the present situation of red-meat abattoirs in respect of structural requirements is as reflected in Table 3.

THE ENFORCEMENT OF THE ACT
IN RESPECT OF ABATTOIR MANAGEMENT

The Department’s policy in respect of the enforcement of the Act stipulates 14 basic hygiene requirements that have to be met continuously at all abattoirs and slaughter units.

Abattoirs

Slaughter units

FIG. 2 Present position of abattoirs in respect of structural requirements (1987)

TABLE 3. Present situation of red-meat abattoirs in respect of
Structural Requirements

<table>
<thead>
<tr>
<th>Description</th>
<th>Number of Abattoirs</th>
<th>% Slaughtered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abattoirs complying with the Act</td>
<td>218</td>
<td>82.5</td>
</tr>
<tr>
<td>Abattoirs under Construction:</td>
<td>26</td>
<td>3.1</td>
</tr>
<tr>
<td>New or improved Abattoirs planned:</td>
<td>36</td>
<td>14.37</td>
</tr>
<tr>
<td>Abattoirs closing or no application for improvement received by the Minister</td>
<td>3</td>
<td>0.3</td>
</tr>
<tr>
<td>TOTAL</td>
<td>283</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Abattoirs during slaughtering. When any of these basic hygiene requirements are not met, an order is served on the owner of the abattoir under Section 30 of the Act which prohibits any further slaughtering until the defects have been rectified.

Regional officers carried out 2,237 inspections at abattoirs and related industries during the year under review to ensure that the necessary requirements are complied with.

Twenty-one orders were served on abattoir owners under Section 30 of the Act. Eleven prosecutions were instituted against people slaughtering illegally and 1 prosecution against a person who repeatedly exceeded his maximum allowable daily throughput.

Meat Inspection at Abattoirs

Inspections are carried out on slaughter animals, both prior to and after slaughter, to prevent diseases from being transmitted to humans and animals through contaminated animals, meat or animal products.

During the year under review, the total output at red-meat abattoirs in the RSA amounted to approximately 2,8 million slaughter units. Of these 64% (1,8 million slaughter units) were inspected before and after slaughter by the meat inspection staff of the Subdirective: Meat Hygiene.

FIG. 3. Red-meat slaughtering in 1988: Meat inspections carried out
TABLE 4. Number of animals examined before and after slaughter by the staff of the Subdirectorate: Meat Hygiene during

<table>
<thead>
<tr>
<th>Species</th>
<th>Number of carcasses</th>
<th>Slaughter units*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle</td>
<td>1242 337</td>
<td>1242 337</td>
</tr>
<tr>
<td>Calves</td>
<td>43 436</td>
<td>14478</td>
</tr>
<tr>
<td>Sheep/goats</td>
<td>4 158 691</td>
<td>277 246</td>
</tr>
<tr>
<td>Pigs</td>
<td>1072780</td>
<td>214556</td>
</tr>
<tr>
<td>Horses</td>
<td>893</td>
<td>893</td>
</tr>
<tr>
<td>Ostriches</td>
<td>88 606</td>
<td>44303</td>
</tr>
<tr>
<td></td>
<td><strong>6 6066 743</strong></td>
<td><strong>1 793 813</strong></td>
</tr>
</tbody>
</table>

*1 slaughter unit = 1 head of cattle/1 horse/3 calves/15 sheep or goats/5 pigs/2 ostriches

At Skukuza meat inspection was done on 171 elephants, 1692 buffaloes, 190 hippopotami and 173 impalas.

The Subdirectorate also renders a meat certification service at 2 game export installations.

Fees collected

Fees collected for meat inspection and meat certification for export purposes amounted to R2.796 million during the year under review.

Standardisation of meat inspection procedures

The recommendations of the Directorate Committee of Inquiry into Condemnations and Related Matters were accepted by the Chief Meat Hygiene Officer. Some of the recommendations e.g. feedback of information on condemnations to the producer, have already been implemented.

Privatisation of meat inspection

At 13 abattoirs which were not approved for the export of meat to Switzerland and the EEC, privatisation of primary meat inspection, involving 111 people, commenced.

The number of private veterinarians involved on a part-time basis with secondary meat inspection at abattoirs increased from 41 to 49 during this year.

Hygiene control at poultry abattoirs

The 16 A-grade poultry abattoirs were responsible for approximately 90% of the poultry slaughtered in the RSA during the year under review. Officers of the Subdirectorate supervise the hygiene management at 9 of these abattoirs. Due to insufficient funds these supervisory services could not be extended to the other 7 abattoirs.

The Broiler Organisation of the South African Poultry Association compiled a code of practice in co-operation with the Subdirectorate. This code of practice sets hygiene standards that are similar to the requirements stipulated by the Act.

The objectives of this code had been approved by the Ministerial Advisory Committee on the Animal Slaughter, Meat and Animal Products Hygiene Act. 1967 (Act No. 87 of 1967). The new regulations for poultry abattoirs may therefore be based on this code.

During the year under review 166 752 532 birds were slaughtered in those abattoirs.
where personnel of the Subdirectorate supervise the hygiene management. In red-meat terms this equals 166 752,5 slaughter units (1 slaughter unit 100 birds). This is an increase of 14,7% compared with the poultry slaughtered during the previous year.

MEAT IMPORTED
The Subdirectorate is also involved in the control of chilled and frozen imported meat. This includes the approval of plants from which the RSA imports meat. There are at present 21 countries on the RSA’s import list, with a total of 935 approved plants.

The quantity of meat and meat products imported during the year under review has increased tremendously (364%) and amounts to 57813 t, compared with 15 871 t the previous year. This caused an increased work load for the officers of the Subdirectorate.

A new import permit for red meat has been designed during the year under review, to minimise the occurrence of illegal practices in this field.

Imports of mechanically deboned poultry meat have also increased. Of the 10 763 t imported last year, 2065 t (19%) did not comply with the microbiological standards and were consequently not released for human consumption.

Three overseas plants that did not comply with the RSA’s microbiological standards were temporarily removed from the import list until their quality control has been improved.

The Subdirectorate also compiled a new procedure to ensure better control over imported meat in freezer stores that had not been approved for human consumption.

MEAT EXPORTED
There are at present 9 establishments in the RSA that have been approved for exporting meat to the EEC. There are 38 approved plants for export to other countries.

Two inspectors of the EEC visited the approved plants in the RSA during the year and carried out inspections at 7 refrigeration stores and two abattoirs/deboning plants.

Two veterinary surgeons from the United Kingdom inspected a casings factory and 2 canning plants approved for exports to their country. The inspections concluded satisfactorily.

Inspections were also carried out at 2 venison export plants to ensure that the venison intended for export conforms with all the requirements for certification.

The total quantity of meat certified for export during the past year amounted to 5 889 t.

The EEC decided to prohibit the import of meat from countries where growth stimulants are used in slaughter stock. At the proposal of the Chief Meat Hygiene Officer, farms in the Republic where no growth stimulants are used, were identified and meat intended for export to the EEC will be obtained only from these farms. Meat samples will also be analysed to ensure that they are free of residues of hormones and other chemicals.

In view of this prohibition, tests were carried out on 230 samples of beef, pork and poultry meat to determine whether traces of hormones were present. All the tests were negative.

LABORATORY SERVICES
Section 22 of the Act authorises the Chief Meat Hygiene Officer to lay down requirements for the laboratory facilities at abattoirs. The purpose of an abattoir laboratory is to ensure that a proper standard of hygiene is maintained at the abattoir and to facilitate the decisions of the meat inspection personnel in regard to the meat being fit for human consumption.
Laboratory services at abattoirs include the following:

- Examination of blood smears
- Histopatological investigations
- Bacterial monitoring of water, meat, equipment, working surfaces, workers’ hands, clothing, etc.
- Determining of pH, which is a good indication of the shelf-life of meat
- Tests to distinguish between jaundice and normal yellow discolouration of carcass fat
- Determination of harmful chemical residues in meat and organs
- Identification of diseases in slaughter stock.

Tests (3,297) were carried out during the year under review to determine whether antibiotic residues were present in carcasses, of which 98 were positive. Meat and organs that contain antibiotic residues may be harmful to human health and are therefore condemned.

The Directorate: Veterinary Services was also responsible for monitoring BHC residues in the meat of animals from areas where BHC was used to combat locusts. Very few positive cases were found. In all cases the BHC residues were below the acceptable limit determined by the Department of National Health and Population Development.

TRAINING

The Subdirectorate presented 5 Meat Hygiene refresher courses for veterinarians during the year under review. These courses were attended by 70 veterinarians of whom 39 were employed by the Government and 31 came from private practices or other private concerns.

These 3-day courses included a wide range of subjects dealing with the proper management of hygiene in abattoirs. The powers and duties of veterinary meat inspectors at abattoirs received special attention. The final day of these courses was spent on the abattoir floor where participants had the opportunity to perform primary and secondary meat inspections under supervision.

At this stage most of the veterinarians authorised by the Chief Meat Hygiene Officer to act as veterinary meat inspectors at abattoirs have attended a refresher course in Meat Hygiene during the past 2 years.

Two refresher courses in Meat Hygiene for senior meat inspectors were also presented during this time. The courses were attended by 36 chief meat inspectors from the Directorate and 7 health inspectors from the local authorities. The main objective of these courses was to promote uniformity, particularly in respect of primary meat inspection.

Evaluations of these courses by the participants revealed that the courses were effective and underlined the need for more courses of this nature.

The Subdirectorate was actively involved with the Control Committee for Abattoir Training during this year and played a major part in securing additional training facilities at Pyramid abattoir. Officers of the Subdirectorate also made valuable contributions towards the presentation of the training courses for abattoir management personnel by this committee.

ADDENDUM

The recommendations of the Co-ordinating Committee of Inquiry into the “wet carcass syndrome” were implemented during the previous year. Due to the implementation of
these recommendations, this syndrome which caused condemnations worth millions of rands in the past, has almost completely disappeared during the year under review.

The recommendations regarding the slaughter of animals on the day of arrival at the abattoir, were implemented during this year. This will be beneficial to abattoir owners from both a management and a financial point of view.