



THE ANIMAL HEALTH STATUS OF PALAU

by

**Peter Saville
Animal Health Adviser**



Noumea, New Caledonia
1999

SECRETARIAT OF THE PACIFIC COMMUNITY

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Secretariat of the Pacific Community
98848 Noumea Cedex
BP D5
New Caledonia

Telephone: +687 26 20 00
Facsimile: +687 26 38 18
E-mail: spc@spc.org.nc
<http://www.spc.org.nc/>

Secretariat of the Pacific Community
Private Mail Bag
Suva
Fiji

Telephone: +679 370021
Facsimile: +679 370021
Email: spc@spc.org.fj
<http://202.0.157.4>



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ABSTRACT

Aspects of the animal health status of Palau have been investigated during a series of visits between March 1993 and November 1996. The findings of other surveys are also included as appropriate.

The results indicate that there is no serological or clinical evidence of the major exotic diseases in any species present in Palau. Diseases of public health concern elsewhere (bovine brucellosis and tuberculosis) have not been recognised in Palau, however cattle, goats and pigs exhibit serological evidence of the widespread distribution of leptospirosis.

Although the number of poultry samples examined was small and not representative, results served to confirm that poultry diseases, which are widespread elsewhere in the region, are also present on Palau. These include infectious bursal disease, infectious bronchitis, Marek's disease.

The high incidence of toxoplasmosis in the caprine population is of public health concern. The feral cat population is thought to constitute the reservoir for this disease.

There is no clinical evidence and no reports to indicate that canine rabies is present or has occurred in Palau.

RÉSUMÉ

Plusieurs aspects de la situation zoonitaire de Palau ont fait l'objet d'une enquête lors de plusieurs missions effectuées entre mars 1993 et novembre 1996. Les résultats pertinents d'autres études sont également présentés.

Les enquêtes n'ont permis de découvrir chez aucune des espèces présentes à Palau des signes sérologiques ou cliniques d'une maladie exotique importante. Les maladies qui présentent un risque pour la santé publique à d'autres endroits (la brucellose et la tuberculose bovines) n'ont pas été diagnostiquées à Palau; cependant, les bovins, les caprins et les suidés présentent des signes sérologiques indiquant que la leptospirose est largement répandue.

Le nombre de volailles échantillonné était faible et non représentatif, mais les résultats ont néanmoins permis de confirmer que les maladies aviaires qui sont largement répandues ailleurs dans la région, notamment la bursite et la bronchite infectieuses et la maladie de Marek, sont également présentes à Palau.

La forte incidence de la toxoplasmose dans le cheptel caprin est préoccupante sur le plan de la santé publique. La population de chats retournés à l'état sauvage semble constituer le réservoir de cette maladie.

Aucun signe clinique ni aucun rapport ne permet d'affirmer que la rage canine est ou a jamais été présente à

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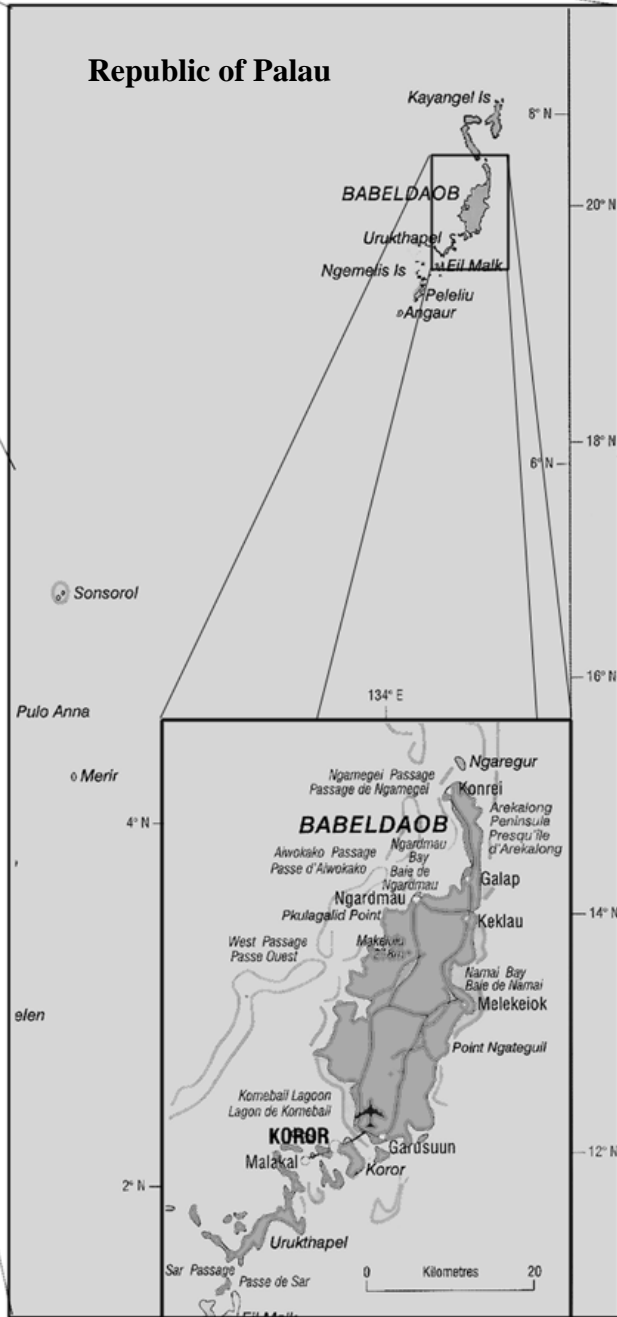
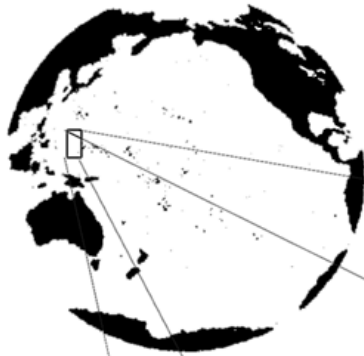
I gratefully acknowledge the assistance and hospitality given to me by Mr. Herman Francisco, Chief, Division of Agriculture and staff of the Palau Bureau of Resources and Development, in particular the Livestock Officer, Mr. Constantine Remelik. I am also indebted to the owners of livestock who made their animals available for testing during the course of the survey.

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CONTENTS

	Page
Abstract & Résumé	3
Acknowledgements	4
Contents	5
Map of Palau	6
Introduction	7
Location and topography	7
Literature	7
Agriculture in Palau	7
Selection of diseases	8
Sampling strategy	8
Materials and methods	8
Results	10
Diseases of cattle	10
Diseases of goats	12
Diseases of pigs	14
Diseases of poultry	16
Diseases of other species	16
Conclusions	17
References	18
Acronyms	19





Introduction

The survey of the animal health status of Palau was carried out between 1993 and 1996 by the SPC Animal Health Adviser.

The objective of the survey was to confirm the presence or absence of livestock diseases that are considered to be of significant economic or public health importance to the people of Palau. The information obtained during the survey will enable Palau to develop appropriate quarantine protocols to prevent the introduction of diseases not present on the island; provide an indication of the distribution of diseases which are known to be present; and facilitate the development of control or eradication programmes.

With the possible exception of companion animals, Palau is unlikely to become an exporter of livestock or livestock products in the foreseeable future. However, due to the level of movement of people between Palau and neighbouring countries, most notably South East Asia with the tradition of presenting gifts of food, access to information on the animal health status of the livestock population will be of value to the quarantine services of the recipient countries.

Location and topography

The islands of the Republic of Palau, part of the western Caroline islands, are located about 250 km north of the equator between 6°N and 9°N latitude and between 133°E and 135°E longitude. Lying approximately 1,200 km north of Indonesia, 880 km east of Mindanao in the Philippines and 1,200 km to the southwest of Guam, Palau is strategically located between South East Asia and the Pacific Islands. This situation places Palau at risk from the introduction of exotic livestock diseases from neighbouring countries where they are considered endemic.

The land area of Palau totals 488 km² and comprises the 'high' islands of Babeldaob, Arakebesang, Koror and Malakal, which are of volcanic origin and where the majority of agricultural activity takes place, plus a number of coral atolls and raised coral limestone islands.

Literature

There are no published records on the animal health status of Palau, however a number of unpublished reports were written by consultants, who advised on aspects of animal health and production on the findings of surveys during the period when the country was administered as a United States Trust Territory. Most of these reports are no longer available and failed to differentiate between the different island groups within the Trust Territories.

Agriculture in Palau

Agricultural activity is largely limited to subsistence cropping, with limited though increasing commercial activity. Crops commonly grown are banana, cassava, sweet potato, taro, and vegetables such as Chinese cabbage, onions, aubergines and tomatoes.

Poor soil fertility in the areas developed for grazing have limited the carrying capacity to 1 bovine animal per 3 hectares. A number of semi-commercial pig farms utilise waste vegetable material (primarily banana stems) to produce pigs for the local market.

The cattle population consists primarily of the government herd, totalling 12 animals (mainly breeding females) at Neckken plus an additional 10 animals which are owned by private farmers. The main emphasis of the government livestock policy is now placed on the distribution of steers to smallholders for rearing.

During the implementation of a project to develop beef production, the government farm used to carry more cattle, however it was reported that problems associated with weeds and the excessive slaughter of breeding stock subsequently led to the reduction of numbers to the present level.

At the time of the final sampling visit in 1996, the livestock populations were estimated to be as follows:

Cattle	23
Pigs	862
Poultry	20,702
Ducks & Guinea Fowl	980
Horses	3
Buffalo	1
Goats	32

Selection of diseases

Diseases to be investigated were selected on the basis of public health risk, economic significance and regional epidemiological importance with particular reference to the diseases which are notifiable to the FAO and OIE.

Sampling strategy

Where possible, diseases were investigated through serological sampling of a statistically significant sample of the population. In the case of bovine tuberculosis and bovine brucellosis an attempt was made to test the entire eligible cattle population. Diseases were also investigated clinically.

Sample sizes were determined using the text *Livestock Disease Surveys: A Field Manual for Veterinarians* by Cannon and Roe. Due to the small populations of certain species, in some cases it was impractical to collect a statistically significant sample.

Materials and methods

Blood samples were collected by vacutainer from all species included in the survey. After being allowed to clot overnight, the serum was separated and stored at -20°C . If necessary, the serum was centrifuged at 2000 rpm for 10 minutes.

Bovine serum samples were collected from all female cattle over the age of 12 months and all males capable of, or being retained for breeding. Samples were allowed to clot overnight and the serum separated and centrifuged at 2000 rpm for 10 minutes. All cattle were subjected to the intra-dermal caudal fold tuberculin test on at least two occasions, using 0.1 ml Bovine PPD 1 mg (100,000 units) per ml. Reaction was evaluated by palpation of the injection site 72 hours after injection.

Due to the small size of the national cattle herd, all samples were submitted for laboratory analysis. This gave a level of confidence of 95% of detecting an infected animal assuming that the disease would be present in 10% of the population.

Sufficient blood samples were collected at random from the pig population to ensure a minimum level of confidence of 95% of detecting a diseased animal assuming that the disease would be present in 5% of the population. Samples were allowed to clot overnight and the serum separated and centrifuged at 2000 rpm for 10 minutes.

Due to the small number of goats which remain on Palau and their widespread distribution, it was not possible to obtain a representative sample. The future of the goat population is uncertain, although the government has indicated that it intends to introduce new stock.

The domestic poultry on Palau comprise two distinct populations (namely poultry for human consumption or egg production, and birds bred specifically for fighting) which are segregated according to purpose. The high value and importance of the fighting birds precluded them from sampling, however it is reasonable to

assume that avian diseases cycling in the population would be apparent in the commercial units where immunity to avian diseases would be expected to be lower. Sufficient blood samples were collected at random from the commercial poultry population to ensure a minimum level of confidence of 95% of detecting a bird that had been infected assuming that the infection would be present in at least 5% of the population.

After separation, serum samples were stored at -20°C in Suva prior to shipment to the co-operating laboratories. 1 ml aliquots of serum were shipped in duplicate microtitre tubes to the Central Animal Health Laboratory, Wallaceville, New Zealand and in eppendorf tubes to the Veterinary Pathology Laboratory, Koronivia, Fiji; Laboratoire Territorial de Diagnostique Vétérinaire, New Caledonia; the WHO Collaborating Centre for Reference and Research on Leptospirosis, Laboratory of Microbiology and Pathology, Brisbane, Queensland, Australia.

Arrangements had also been made with the Centers for Disease Control and Prevention (CDC) Atlanta, Georgia, U.S.A. in 1995 to test porcine sera, however although the sera were hand carried to the laboratory by a CDC epidemiologist and we were provisionally advised that all samples were negative for Japanese encephalitis, no results were ever received.



RESULTS

DISEASES OF CATTLE

11 blood samples were collected from cattle present on Palau in 1994. A further 9 samples were obtained in 1995, and 10 samples were collected in 1996, primarily from the cattle in the government herd. In 1995, government policy changed to facilitate the distribution of cattle (primarily steers) to small holders for fattening, however the breeding herd remained under the supervision of the Department of Agriculture, and it is assumed that the health status of these animals is representative of the whole population.

OIE List A diseases

During the course of the visits it was possible to examine individually the majority of the animals, and at no time was there any clinical evidence to indicate that any exotic OIE List A diseases were present in cattle in Palau at the time of examination.

Bluetongue (CAHL) – 10 serum samples were tested for bluetongue using the ELISA and were negative. These results give a 95% level of confidence that the prevalence of bluetongue is $\geq 23\%$. It was not possible to confirm that the potential vectors for this disease are present in Palau, however the known distribution in the region of the main vector, *Culicoides brevitarsis*, includes Indonesia, Australia, Papua New Guinea, Solomon Islands, New Caledonia, Fiji and Tonga (St George).

OIE List B diseases – Clinical/abattoir investigations

Bovine malignant catarrh – There are no clinical reports of bovine malignant catarrhal fever (MCF) having occurred in Palau. None of the natural hosts for this disease are present in Palau. (It is accepted that outbreaks can occur in the absence of natural hosts).

Echinococcosis/hydatidosis – There are no reports which suggest that echinococcosis/hydatidosis is present in Palau, however in the absence of meat inspection and with the importation of dogs from infected areas, further investigations are required.

Bovine tuberculosis – (1993–96) – All bovines at the government station were subjected to the intradermal caudal fold tuberculin test (in 1993, '94, '95 and '96) with 1mg/ml bovine tuberculin PPD and were negative. There are no reports to suggest that the disease has ever occurred and from the available results it would appear that bovine tuberculosis is not present in Palau.

Cysticercosis – There are no reports to indicate that bovine cysticercosis occurs in Palau.

Dermatophilosis – No clinical cases suggestive of infection with *Dermatophilus congolensis* were seen during the survey.

OIE List B diseases – serological investigations

Paratuberculosis (CAHL – 1994) – 10 samples were tested for paratuberculosis by CFT. Three samples gave a positive reaction. The animals which were sampled did not exhibit any of the characteristic symptoms of Johnes Disease, however one privately owned animal which was examined subsequently did present with the signs of paratuberculosis. Unfortunately, due to lack of facilities to restrain the animal, it was not possible to obtain samples to confirm the diagnosis. Paratuberculosis would appear to be present in Palau.

Babesiosis (LTDV – 1995) – 9 samples tested negative for *Babesia bovis* and *Babesia bigemina*. As ixodid ticks are endemic in Palau and bovine babesiosis is believed to be present in the Northern Mariana Islands, future importations of breeding cattle should include measures to prevent the introduction of babesiosis.

Anaplasmosis (LTDV – 1995) – 9 samples were tested for anaplasmosis. All samples were negative for

anaplasmosis. Although clinical evidence of anaplasmosis has never been reported, the presence of ixodid ticks would enable the disease to become established should it be imported in future with breeding cattle.

Leptospirosis (LTDV – 1994, CCRRL – 1996) – 10 samples were tested in 1994 for antibody to a panel of 10 serovars and 4 were found to have significant titres (≥ 100 i.e. positive at a dilution of equal to or greater than 1 in 100) to *L. sejroe*. The serovars which were tested and the serogroups they represent were as follows:

SEROGROUP	SEROVAR
Australis	<i>australis</i>
Autumnalis	<i>autumnalis</i>
Ballum	<i>castellonis</i>
Canicola	<i>canicola</i>
Hebdomadis	<i>hebdomadis</i>
Icterohaemorrhagiae	<i>copenhageni</i>
Pomona	<i>pomona</i>
Sejroe	<i>sejroe</i>
Sejroe	<i>hardjo</i>
Tarassovi	<i>tarassovi</i>

In 1997 a further 10 samples from the 1996 collection were also tested by the Leptospiral MAT for the following serovars:

SEROGROUP	SEROVAR
Pomona	<i>pomona</i>
Sejroe	<i>hardjo</i>
Tarassovi	<i>tarassovi</i>
Grippotyphosa	<i>grippotyphosa</i>
Celledoni	<i>celledoni</i>
Icterohaemorrhagiae	<i>copenhageni</i>
Australis	<i>australis</i>
Pyrogenes	<i>zanoni</i>
Pyrogenes	<i>robinsoni</i>
Canicola	<i>canicola</i>
Grippotyphosa	<i>kremastos</i>
Hebdomadia	<i>szwajizak</i>
Sejroe	<i>medanensis</i>
Autumnalis	<i>bulgarica</i>
Cynopteri	<i>cynopteri</i>
Ballum	<i>ballum</i>
Bataviae	<i>bataviae</i>
Djasiman	<i>djasiman</i>
Javanica	<i>javanica</i>
Panama	<i>panama</i>
Shermani	<i>shermani</i>

5 samples were found to have serological evidence (≥ 50 , i.e. positive at a dilution of equal to or greater than 1 in 50) of exposure to *L. hardjo*. The presence of antibody in 5 animals (of the 10 sampled – 50%) would indicate that *L. hardjo* is endemic in the cattle herd.

Bovine brucellosis (KRS & CAHL – 1994, '95 & '96) – All samples tested negative on two occasions ('94 and '95) at the Veterinary Pathology Laboratory, Koronivia using the Rose Bengal Plate test. In 1996, one sample tested positive for brucellosis with the Rose Bengal Plate test but subsequently tested negative by CFT. Palau is probably free from bovine brucellosis.

Enzootic Bovine Leukosis (CAHL – 1994) – 9 samples were subjected to the AGID for Enzootic Bovine Leukosis and 4 were positive. Enzootic Bovine Leukosis is endemic in Palau.

IBR/IPV (CAHL – 1994) – 10 samples were tested for Infectious Bovine Rhinotracheitis using the SNT. 5 samples were positive. Infectious Bovine Rhinotracheitis may be considered to be endemic in Palau.

Theileriasis (LTDV – 1994) – 9 samples were tested for serological evidence of exposure to *Theileria buffeli*. 2 samples were positive and one sample was considered to be doubtful. *Theileria buffeli* is present in Palau.

List C and other diseases

Bovine ephemeral fever (EMAI – 1995) – 10 samples tested negative to the BEF virus neutralisation test at 1/2 dilution. Bovine ephemeral fever virus is probably not present in Palau. No information is available on the presence and distribution of potential BEF vectors, although the known distribution in the region of the vector, *Culicoides* sp., includes Indonesia, Australia, Papua New Guinea, Solomon Islands, New Caledonia, Fiji and Tonga (St George).

Bovine pestivirus – Mucosal disease/Bovine Viral Diarrhoea (LTDV – 1994) – 10 samples were tested for bovine pestivirus with negative results. Palau is probably free from bovine pestivirus.

Akabane virus (EMAI – 1995) – 10 samples were tested with the virus neutralisation test for Akabane virus. 3 samples were positive. Akabane virus may be regarded as endemic in Palau.

Simbu serogroup (EMAI – 1995) – 10 samples were tested by ELISA for serological evidence of exposure to the Simbu serogroup viruses. There is no serological evidence to indicate that viruses of the Simbu serogroup may be present in Palau.

Ectoparasites – *Ixodidae* (provisionally identified as *Boophilus microplus* and *Haemaphysalis longicornis*) were frequently seen during the investigation.

DISEASES OF GOATS

OIE List A Diseases

There is no clinical evidence to indicate that any exotic OIE List A diseases may be present in goats in Palau at this time, however as there has been serological evidence of the presence of certain bluetongue serovars elsewhere in the region, samples were examined for bluetongue.

Bluetongue (CAHL – 1996) – 6 samples were negative for antibody to bluetongue by AGID. It is assumed that potential vectors for this disease are present in Palau (see Bovine results).

OIE List B Diseases

Q fever (CAHL – 1996) – 6 samples were tested by CFT for serological evidence of exposure to 'Q' fever (*Coxiella burnetti*). All samples were negative.

Caprine Brucellosis (KRS – 1996) – 6 samples were negative on the RBPT for evidence of brucellosis. There is no evidence to suggest that caprine brucellosis is present in Palau.

Caprine arthritis/encephalitis (CAHL – 1996) – 6 samples were subjected to the ELISA test for CAE. One sample demonstrated antibodies to caprine arthritis/encephalitis. As breeding stock had been imported from Fiji where CAE had subsequently been found to be established at the Government Research Stations, it is reasonable to assume that the disease was introduced from this source.

Echinococcus/hydatidosis – There are no reports which suggest that echinococcosis/hydatidosis is present in goats in Palau.

Leptospirosis (CCRRL – 1996) – Seven samples were tested for serological evidence of exposure to a panel of 19 serovars.

SEROGROUP	SEROVAR
Pomona	<i>pomona</i>
Sejroe	<i>hardjo</i>
Tarassovi	<i>tarassovi</i>
Grippotyphosa	<i>grippotyphosa</i>
Celledoni	<i>celledoni</i>
Icterohaemorrhagiae	<i>copenhageni</i>
Australis	<i>australis</i>
Pyrogenes	<i>zanoni</i>
Pyrogenes	<i>robinsoni</i>
Canicola	<i>canicola</i>
Grippotyphosa	<i>kremastos</i>
Hebdomadia	<i>szwajizak</i>
Sejroe	<i>medanensis</i>
Autumnalis	<i>bulgarica</i>
Cynopteri	<i>cynopteri</i>
Ballum	<i>ballum</i>
Bataviae	<i>bataviae</i>
Djasiman	<i>djasiman</i>
Javanica	<i>javanica</i>
Panama	<i>panama</i>
Shermani	<i>shermani</i>

2 samples provided serological evidence (≥ 50) of antibodies to *robinsoni*, one of which was also positive to *zanoni* (≥ 100). A third sample was positive (≥ 100 , i.e. equal or greater than a dilution of 1 in 100) for *bulgarica*. The presence of antibody in 3 of the 7 samples tested (42.8%) confirms that leptospirosis is present in the goat population in Palau.

List C diseases

Toxoplasmosis (CAHL – 1996) – All 6 samples tested were serologically positive for toxoplasmosis on LAT screening. Two samples exhibited very high titres $\geq 1/4096$ which would indicate recent exposure to infection. Although only goats were sampled for toxoplasmosis, with the presence of feral cats, toxoplasmosis may be considered to be widespread in Palau, representing a significant public health concern.

DISEASES OF PIGS

OIE List A Diseases

There is no clinical evidence to indicate that any OIE List A diseases are present in pigs in Palau at this time, however as Palau is frequently visited by fishing boats from countries known to be infected with hog cholera (classical swine fever), samples were examined for antibody to Pestivirus.

Hog cholera (CAHL – 1996) – 60 samples collected during the visits in 1995 and 1996 were tested for antibodies to Pestivirus by ELISA. All samples were negative and there is no indication to suggest that hog cholera is present in Palau.

OIE List B Diseases

Aujeszky's Disease (CAHL – 1996) – 60 samples were negative to the ELISA test for Aujeszky's disease. Aujeszky's disease is unlikely to be present in Palau.

Porcine brucellosis (CAHL – 1996) – All 60 samples were examined for porcine brucellosis by the RBPT and found to be negative. There is no evidence that porcine brucellosis is present in Palau.

Trichinosis (CAHL – 1996) – 60 samples were tested by ELISA for antibody to Trichinosis. One sample was found to be positive. This result was subsequently confirmed by Immuno blot testing. There is a need for further investigation of the *Trichinella spiralis* status of Palau.

Leptospirosis (CCRRL – 1996) – 55 samples were tested by the leptospiral MAT for exposure to a panel of 19 serovars.

SEROGROUP	SEROVAR
Pomona	<i>pomona</i>
Sejroe	<i>hardjo</i>
Tarassovi	<i>tarassovi</i>
Grippotyphosa	<i>grippotyphosa</i>
Celledoni	<i>celledoni</i>
Icterohaemorrhagiae	<i>copenhageni</i>
Australis	<i>australis</i>
Pyrogenes	<i>zanoni</i>
Pyrogenes	<i>robinsoni</i>
Canicola	<i>canicola</i>
Grippotyphosa	<i>kremastos</i>
Hebdomadia	<i>szwajizak</i>
Sejroe	<i>medanensis</i>
Autumnalis	<i>bulgarica</i>
Cynopteri	<i>cynopteri</i>
Ballum	<i>ballum</i>
Bataviae	<i>bataviae</i>
Djasiman	<i>djasiman</i>
Javanica	<i>javanica</i>
Panama	<i>panama</i>
Shermani	<i>shermani</i>

Antibodies to the following serovars were detected:

<i>pomona</i>	1 sample (=50)
<i>hardjo</i>	8 samples (≥ 1600)
<i>grippotyphosa</i>	1 sample (=100)
<i>copenhageni</i>	3 samples (≥ 400)
<i>zanoni</i>	3 samples (≥ 800)
<i>robinsoni</i>	5 samples (≥ 1600)
<i>canicola</i>	1 sample (=800)
<i>szwajizak</i>	1 sample (=50)
<i>cynopteri</i>	1 sample (≥ 50)
<i>panama</i>	11 samples (≥ 200)
<i>shermani</i>	1 sample (=50)

22 samples (40%) exhibited evidence of exposure to one or more serovars (one sample had antibodies to 6 serovars which indicates that some degree of cross reaction between serovars was present).

High titre reactions (≥ 400), which could be indicative of recent exposure, were detected for *hardjo*, *zanoni*, *robinsoni* and *canicola*. The results confirm that leptospirosis in pigs is widespread in Palau and represents a serious zoonotic threat.

Cysticercosis (C. cellulosae) – There are no reports to indicate that cysticercosis occurs in pigs in Palau.

Echinococcus/hydatidosis – There are no reports which suggest that *Echinococcus/hydatidosis* is present in pigs in Palau.

Japanese encephalitis (LMP – 1997) – 62 porcine sera were tested using an ELISA to detect antibody to the Japanese encephalitis virus. There was no evidence of exposure to the virus. Although Palau was probably free at the time of the survey, Japanese encephalitis has been expanding within the region, and an ongoing surveillance programme would be desirable.

Additional porcine diseases

Porcine reproductive and respiratory syndrome (CAHL) – 60 samples were tested by ELISA for serological evidence of exposure to porcine reproductive and respiratory syndrome with negative results.

Parasitic diseases – the following internal parasites have been identified (Cleveland, pers. comm.).

Ascaris sp.
Ascarops strongylina
Oesophagostomum sp.
Stephanurus dentatus
Metastrongylus apri

DISEASES OF POULTRY

41 samples were collected from chickens at 6 locations during the 1996 visit. Although most samples were obtained from commercial units, a number of samples were also obtained from semi-commercial backyard flocks. The vaccination histories of the flocks which were sampled was not available.

OIE List A Diseases

Newcastle Disease (CAHL – 1996) – All samples were negative by HIT for Newcastle Disease. There have been unconfirmed reports that Newcastle disease has occurred in Palau. There is no serological or clinical evidence to indicate that Newcastle disease was present in Palau at the time of the survey.

Highly pathogenic avian influenza (CAHL – 1996) – All samples (41) were negative for highly pathogenic avian influenza (HPAI) by AGID. HPAI is not reported elsewhere in the region and in the absence of clinical signs, it is unlikely to be present in Palau.

OIE List B Diseases

Avian infectious laryngotracheitis (CAHL – 1996) – 1 sample (2.4%) was positive by the ELISA test for ILT. The positive bird was a cockerel owned by a semi-commercial operation. Surveys carried out in other Pacific Island countries have shown that when present, the prevalence of ILT is at least 25%. Although it has not been possible to establish the sensitivity and specificity of the ELISA test in this instance, York et al. (1982) demonstrated a non-specific reaction in 2.7% of birds sampled. As the prevalence of ILT in this survey falls within the range quoted by York et al., it appears that this result may also be due to a non-specific reaction and is insufficient to confirm that ILT is present in Palau.

Avian infectious bronchitis (CAHL – 1996) – 37 samples (90.2%) were positive for IB on ELISA (7.7%). As positive samples were obtained from all locations, IB can be assumed to be endemic in Palau.

Infectious bursal disease (CAHL – 1996) – 5 samples were positive (12.2%) by ELISA for Infectious bursal disease (IBD). Positive cases were confined to two units which import day-old chicks. A strain of IBD with low pathogenicity is known to be present in most countries in the region, and in the absence of clinical signs it would appear that the same strain of IBD may have been recently introduced into Palau.

Marek's disease (CAHL – 1996) – 19 samples were positive (46.3%) to the AGID for Marek's disease. Marek's disease is present in Palau and widely distributed among the commercial and backyard layer flocks.

Fowl pox – fowl pox is reported to be widespread in Palau.

List C and other diseases

Avian encephalomyelitis (CAHL – 1996) – 9 samples (21.9%) showed serological evidence of exposure to avian encephalomyelitis. Positive cases were widely distributed. Avian encephalomyelitis is established in Palau.

DISEASES OF OTHER SPECIES

Dogs and cats were not included in the serological survey, however during the visits to Palau it was possible to establish that there is no clinical evidence to suggest that canine or feline rabies is present or has ever been diagnosed in Palau.

CONCLUSIONS

Palau appears to be free of all the major exotic diseases of livestock. There is no serological evidence to indicate the presence of bluetongue, hog cholera, Newcastle disease or highly pathogenic avian influenza. Although serology for other OIE list A diseases was not undertaken, there is no clinical evidence to suggest that these diseases could be present in Palau. The close geographical proximity of Palau to countries in South East Asia where OIE List A diseases are known to be present demands appropriate quarantine controls to prevent introductions.

The widespread distribution of leptospirosis in the mammalian species is a major cause for concern. Although the impact could not be fully evaluated during the survey, the disease is known to be a significant zoonosis of public health and economic importance.

The presence of a number of significant diseases in the cattle population is of concern. Should the government of Palau consider future importations of live cattle in large numbers, to encourage the establishment of a domestic beef industry, it would be desirable to slaughter the existing herd (only 23 cattle at the time of the survey), to remove the nucleus of infection.

With the exception of leptospirosis, there is no serological evidence or clinical reports of other significant swine diseases. The disease situation in poultry reflects the source of imported day-old chicks and closely resembles the findings in other Pacific Island countries.



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ACRONYMS

AGID	–	Agar Gel Immunodiffusion Test
CAHL	–	Central Animal Health Laboratory, Wallaceville, New Zealand
CCRRL	–	WHO Collaborating Centre for Reference and Research on Leptospirosis, Laboratory of Microbiology and Pathology, Brisbane, Queensland, Australia.
CFT	–	Complement Fixation Test
ELISA	–	Enzyme Linked Immuno-sorbent Assay
EMAI	–	Elizabeth Macarthur Agricultural Institute, Camden, N.S.W., Australia
FAO	–	Food and Agriculture Organization of the United Nations
HIT	–	Haemagglutination Inhibition Test
KRS	–	Koronivia Research Station, Fiji
LAT	–	Latex Agglutination Test
LTDV	–	Laboratoire Territorial de Diagnostique Vétérinaire, Port Laguerre, New Caledonia
MAT	–	Microscopic Agglutination Test
OIE	–	Office International des Epizooties
RBPT	–	Rose Bengal Plate Test
SAT	–	Serum Agglutination Test
SNT	–	Serum Neutralisation Test
WHO	–	World Health Organization



