III. Technical progress in DIC, Tanjungkarang

Techniques for the examination and diagnosis of animal diseases have gradually progressed, but there are still unsatisfactory points in DIC. Present accomplishments are as follows;

1. Virology Section

Serological tests such as hemagglutination and hemagglutination inhibition (HI) tests have been routinely applied for the diagnosis of Newcastle disease (ND) as well as for the vaccination response against ND virus in the field. A HI test was also used for the demonstration of Akabane-disease-virus parainfluenza-virus Type 3 and Japanese-encephalitis-virus infections of cattle, etc. But, a neutralization test is not yet well developed.

In order to isolate viruses and to do neutralization tests, the tissue culture should be more studied. In the present situation, chicken kidney (CK) and chicken embryo (CE) cell cultures have only been applied for the isolation of ND virus. As for bovine cells, bovine kidney (BK) and bovine testis (BT) cells are suitable for the isolation of viruses of bovine origin, but it is not easy to obtain BK and BT routinely. Cell lines of HmLu and MDBK have been maintained, so that using both cells, virus isolation and neutralization tests should be carried out at least for the important diseases of cattle.

Fluorescent antibody (FA) techniques have been applied for the diagnosis of rabies, Newcastle disease, avian bronchitis and hog cholera routinely. (This disease is not yet present in Indonesia.) Especially for rabies, in order to make a secure diagnosis, positive control (rabbit brain infected with virus fix of rabies) and negative control (normal rabbit brain) should be used in every examination.

Fluorescent antibodies of these diseases must be supplied by institutes of biology in Indonesia and Japan.

2. Bacteriology Section

Serological tests for brucellosis, pullorum disease and mycoplasmosis, and allergy testing for tuberculosis have been routinely carried out. Antigens not only for the above-stated diseases but also for John's disease must be supplied by institutes of biology in Indonesia and Japan.

Techniques for the cultivation and identification of bacteria, especially aerobic ones have been gradually developed, but further efforts are expected. Techniques of how to cultivate anaerobic bacteria must be studied in parallel with those of aerobic bacteria.

3. Parasitology Section

Microscopic examinations of parasitic eggs of helminth, and of protozoa and blood parasites using the blood-smear method have been routinely carried out. Identification of helminth is possible, but that of ectoparasite has not yet been developed.

Serological tests such as complement fixation test of Anaplasma marginale, Ratex agglutination test of Toxoplasma gondii and Agar-gel immunodiffusion test of Leucocytozoon caulleryi were performed; however, more development in this field should be expected.

4. Pathology Section

Autopsy, collection and fixation of dissected materials, post-mortem diagnosis of diseases have been routinely carried out. When dead and live animals were dissected at DIC or at the fields where the animals died, veterinarians of DIC, especially pathologists must give the suggestion on whether the disease is infectious or not, and on the kind of disease. According to the suggestions, materials for the virus isolation and bacterial cultivation should be collected aseptically. When poisoning is suspected, experiments using feed and so on must be performed.

Histopathological diagnosis has also been carried out routinely, and more developments are expected in this field.

5. Laboratory animals

Such laboratory animals as mice, guinea pigs, rabbits and chickens have been raised at DIC, but their management and feeding methods need improvement. Animals used in the experiments must be healthy, and nearly identical in age, sex and genetics. Veterinarians who visit Japan in the near future, need to have the opportunity of getting enough knowledge about laboratory animals.

6. Photography

Macro- and micro-photography are important techniques in laboratory and field works; however, training for the taking of scientific photographs is insufficient. A short term training course in this field needs to be held either in Indonesia or Japan.

IV. Comments and recommendations for future plan

1. Staff and personnel

As stated in the introductory paragraph, the number of staff veterinarians and supporting personnel has increased gradually; however, in addition to the present staff, at least 2 veteriarians, one pathologist and one entomologist, are needed to strengthen the activities of DIC.

2. Laboratory animal shed

There is no satisfactory shed for laboratory animals in DIC, Tanjungkarang, As stated already in this report, the role of laboratory animals in the detection of diseases is important, so that the sheds for this purpose are urgently required.

3. Water supply

DIC has one deep water well which supplies water for the laboratory, animal sheds and staff housing. It seems that the quantity of matter obtained from the one well is insufficient, especially in dry season. One more water well is necessary.

4. Managment of laboratory equipments

In order to manage and maintain the laboratory equipment and instruments, a technical engineer consultant is necessary for DIC.

5. Library

Textbooks and journals are also insufficient at DIC. It is necessary to increase the number of textbooks and to at least obtain important periodical journals

a) American Journal of Veterinary Research (U.S.A.)

b) Journal of American Veterinary Medical Association (U.S.A.)

c) Veterinary Record (U.K.)

d) Japanese Journal of Veterinary Science (Japan)

e) National Institute of Animal Health Quarterly (Japan)

6. Strenghening of the DIC and C types the Provinces of South Sumatra and Bengkulu

B Type DIC has been established at Palembang in South Sumatra and at Bengkulu municipality and Kurotidur in Bengkulu Provinces. South Sumatra Province is large, so the establishment of 2 more B type well equipped DIC's is needed.

As for B type DIC located in the Bengkulu municipality, the buildings were finished but equipment not yet prepared. Cooperation is necessary for this purpose.

7. Telecommunication facility of DIS is not available yet. Since this is a tool for communication between the DIC and the Animal Husbandry Offices as well as between field officers, utmost efforts are desirable to facilitate telephone lines.

V. Lists of table and figures

Table:

Figure:

Table 1. Numbers of applicants and specimens in diagnostic services

Period	Lampung		South Sumatra		Bengkulu		West Jawa		Total	
	No. of* applicants	No. of specimens	No. of applicants	No. of specimens	No. of applicants	No. of specimens	No. of applicants	No. of specimens	No. of specimens	No. of applicants
Jan. 1979/'80	222	468	7	7	4	4			233	479
1980/'81	144	506	14	24	16	21	1	1	175	552
1981/'82	279	1,177	50	455	128	135	5	35	480	1,802

Comments: * No. of applicants is almost equal to No. of farmers.

Table 2. Numbers of applicants and specimens in field investigations

Division	Jan. 1979/'80				1980/'81				1981/'82				
	Lampung	South Sumatra	Bengkulu	Total	Lampung	South Sumatra	Bengkulu	Total	Lampung	South Sumatra	Bengkulu	West Jawa	Total
No. of applicants	1,243			1,243	1,697	93	4	1,794	2,041	114	1	41	2,197
No. of specimens	2,284			2,284	3,583	200	4	3,583	7,606	190	207	41	8,044
Times of investigations	180			180	176	4	1	181	250	3	1	1	255
No. of subdistricts	193			193	264	16	1	281	302	12	1	7	320
No. of villages	291			291	400	20	1	421	506	15	1	23	545

Comments: * No. of applicants is almost equal to No. of farmers.

Table 3. Relationships between diagnostic services and field investigations, and kinds of animals - 1 (Jan. 1979/'80)

Animal	Diagnostic services								Field investigations								Total	
	Lampung		South Sumatra		Bengkulu		Total		Lampung		South Sumatra		Bengkulu		Total			
	No. of applicants	No. of specimens	No. of applicants	No. of specimens	No. of applicants	No. of specimens	No. of applicants	No. of specimens	No. of applicants	No. of specimens	No. of applicants	No. of specimens	No. of applicants	No. of specimens	No. of applicants	No. of specimens	No. of applicants	No. of specimens
Cattle	184	248	2	2	1	1	187	251	1,199	1,234					1,199	1,234	1,386	1,485
Buffalo									1	1					1	1	1	1
Horses																		
Sheep																		
Goats									7	18					7	18	7	18
Swine	1	1					1	1	3	25					3	25	4	26
Chickens	24	183	1	1			25	184	32	1,002					32	1,102	57	1,186
Ducks																		
Dogs	10	20	4	4	3	3	17	27									17	27
Cats	1	1					1	1									1	1
Monkeys																		
Rabbits									1	4					1	4	1	4
Others	2	15					2	15									2	15
Total	222	468	7	7	4	4	233	479	1,243	2,284					1,243	2,284	1,476	2,763

Table 4. Relationships between diagnostic services and field investigations, and kinds of animals - 2 (1980/'81)

Animal	Diagnostic services										Field investigations								Total	
	Lampung		South Sumatra		Bengkulu		West Jawa		Total		Lampung		South Sumatra		Bengkulu		Total			
	No. of applicants	No. of specimens	No. of applicants	No. of specimens	No. of applicants	No. of specimens	No. of applicants	No. of specimens	No. of applicants	No. of specimens	No. of applicants	No. of specimens	No. of applicants	No. of specimens	No. of applicants	No. of specimens	No. of applicants	No. of specimens	No. of applicants	No. of specimens
Cattle	80	167	6	9	2	7			68	183	1,511	1,620	75	94	1	1	1,587	1,715	1,655	1,898
Buffalo	10	13	1	1					11	14	24	28	4	4	3	3	31	35	42	49
Horses																				
Sheep	2	213					1	1	3	214	43	60					43	60	46	274
Goats	15	24	1	1	1	1			17	26	7	90					7	90	24	116
Swine	6	16							6	16	5	11	11	27			16	38	22	54
Chickens	22	41	2	9					24	50	106	1,560	3	75			109	1,635	133	1,685
Ducks	3	6							3	6	1	10					1	10	4	16
Dogs	23	23	2	2	12	12			37	37									37	37
Cats	1	1			1	1			2	2									2	2
Monkeys	1	1							1	1									1	1
Rabbits																				
Others	1	1	2	2					3	3									3	3
Total	144	506	14	24	16	21	1	1	175	552	1,697	3,379	93	200	4	4	1,794	3,583	1,969	4,135

Table 5. Relationships between diagnostic services and field investigations, and kinds of animals - 3 (1981/'82)

Animal	Diagnostic services										Field investigations										Total	
	Lampung		South Sumatra		Bengkulu		West Jawa		Total		Lampung		South Sumatra		Bengkulu		West Jawa		Total			
	No. of applicants	No. of specimens	No. of applicants	No. of specimens	No. of applicants	No. of specimens	No. of applicants	No. of specimens	No. of applicants	No. of specimens	No. of applicants	No. of specimens	No. of applicants	No. of specimens	No. of applicants	No. of specimens	No. of applicants	No. of specimens	No. of applicants	No. of specimens	No. of applicants	No. of specimens
Cattle	102	560	31	435	11	16	4	34	148	1,045	1,746	2,710	11	140	1	207			1,858	3,057	2,006	4,102
Buffalo	3	3			1	3	1	1	5	7	6	19					33	33	39	52	44	59
Horses											1	10					1	1	2	11	2	11
Sheep	6	139							6	139	12	485					1	1	13	486	19	625
Goats	12	63							12	63	72	120					6	6	78	126	90	189
Swine	2	4							2	4	7	35							7	45	9	49
Chickens	84	294	2	3	2	2			88	299	170	3,946	3	50					173	4,006	261	4,305
Ducks	1	2							1	2	27	261							27	261	28	263
Dogs	68	68	17	17	110	110			195	195											195	195
Cats	4	4			3	3			7	7											7	7
Monkeys	3	3							3	3											3	3
Rabbits	8	15							8	15											8	15
Others	4	22			1	1			5	23											5	23
Total	297	1,177	50	455	128	135	5	35	480	1,802	2,041	7,606	114	190	1	207	41	41	2,197	8,044	2,679	9,846

Table 6. Number of specimens submitted to and collected by DIC

Kinds of specimens		Dead & live animals	Heads	Brains	Organs	Blood	Blood smears	Feces	Others	Total
Jan. 1979/'80	Diagnostic service	88			65	133	100	153		539
	Field investigation	122			13	2,528	1,590	1,206	2	5,461
	Total	210			78	2,261	1,690	1,359	2	6,000
1980/'81	Diagnostic service	76	2	21	54	142	173	335	22	825
	Field investigation	28			6	3,307	2,973	1,884	11	8,209
	Total	104	2	21	60	3,449	3,146	2,219	33	9,034
1981/'82	Diagnostic service	210	38	141	102	1,148	226	290	20	2,175
	Field investigation	40			1	7,534	7,120	3,907	10	18,612
	Total	250	38	141	103	8,682	7,346	4,197	30	20,787

Table 7. Relationships between kinds of specimens and animals

Period	Kinds of specimens	Cattle	Buffalo	Horses	Sheep	Goats	Swine	Chickens	Ducks	Dogs	Cats	Monkeys	Rabbits	Others	Total
Jan. 1979/'80	Dead & live animals	5	1				6	176		4			4	14	210
	Heads														
	Brains														
	Organs	60	1					5		10	1			1	78
	Blood	1,451	1			17	14	1,031							2,514
	Blood smears	1,332	1			17	14	326							1,690
	Feces	1,257	1			14	23	51		13					1,359
	Others	1				2		146							149
	Total	4,106	5			50	57	1,735		27	1		4	15	6,000
1980/'81	Dead & live animals	11			2		10	59	6	15				1	104
	Heads									1	1				2
	Brains					1				19	1				21
	Organs	33	4		1	9	1	10						2	60
	Blood	1,435	37		49	97	31	1,489	10	1					3,449
	Blood smears	1,828	45		58	92	28	1,085	10						3,146
	Feces	1,638	28		238	66	20	217	10	1		1			2,219
	Others	6	1		2	20		3				1			33
	Total	5,251	115		350	285	90	2,863	36	37	2	2		3	9,034
1981/'82	Dead & live animals	17	1		4	8	4	160	3	19			12	22	250
	Heads									36	2				38
	Brains	1								133	4	2		1	141
	Organs	94	2			2		5							103
	Blood	3,928	52	11	157	166	19	4,089	260						8,682
	Blood smears	3,090	55	11	156	169	44	3,560	260		1				7,346
	Feces	2,954	50	5	612	144	15	382	25	6	1	1	2		4,197
	Others	15	2		2	3		1	3	2	1		1		30
	Total	10,099	162	27	931	492	82	8,197	551	196	9	3	15	23	20,787

Table 8. Results of diagnose on organs and dead and live animals - cattle and buffalo

No. of applicants	Diagnosis rate (%)	Name of disease and pathognomonic signs	Jan. 1979/'80 Dead & live animals (DLA)	1980/'81 DLA	1980/'81 Organs	1981/'82 DLA	1981/'82 Organs	Total
Infectious diseases		Rama Dewa disease	1/1 *1	3/3	2/2	2/2	1/1	9/9
		Hemorrgagic septicemia					(1/1) *2	(1/1)
		Anaplasmosis	1/1					1/1
12	10.2	Babesiosis				1/1		1/1
Parasitic diseases		Hemonchiasis		1/1		3/3		4/4
		Lungworm disease				1/1		1/1
		Ascariasis		1/1				1/1
7	5.9	Fasciolasis	1/1					1/1
Diseases of alimentary organ and liver		Stomatitis ulcerosa					2/2	2/2
		Tympanitis acuta		1/1		1/1		2/2
		Enteritis catarrhalis						5/5
		Enteritis hemorrhagica		1/1		4/4		5/5
		Fatty liver					2/2	2/2
		Liver cirrhosis			1/1			1/1
21	17.8	Multiple liver necrosis					4/4	4/4
Diseases of respiratory organs		Pneumonia lobaris	1/1			1/1		2/2
		Pneumonia bronchialis			1/1	2/2	4/4	7/7
		Pneumonia purulenta				1/1	6/6	7/7
		Pneumonia interstitialis				1/1		1/1
18	15.3	Pneumonia haemorrhagica					1/1	1/1
Nutritional disorder		Malnutritional cachexia		4/2		2/2	5/1	11/5
5	4.2							
		Pericarditis fibrinoza			(1/1)			(1/1)
		Hemorrhagic diathesis			(1/1) 3/3		1/1	(1/1) 4/4
Others		Nephritis interstitialis					2/2	2/2
		Death due to difficult-birth				1/1		1/1

Table 8. Continued

No. of applicants	Diagnosis rate (%)	Name of disease and pathognomonic signs	Jan. 1979/'80 Dead & live animals (DLA)	1980/'81 DLA	1980/'81 Organs	1981/'82 DLA	1981/'82 Organs	Total
		Myositis necrotica		1/1				1/1
		Pappilomatosis	1/1		2/2		1/1	4/4
15	12.7	*Dermatitis chronica*			1/1			1/1
40	33.9	Undiagrosable			5/5	3/3	(1/1) 31/31	(1/1) 39/39
118	100	Total	5/5	12/10	(2/2) 15/15	23/23	(1/1) 65/61	(4/4) 120/114

Comments: *1 Numerator means number of specimens, and denominator number of applicants, respectively.
*2 ( ) *means* buffalo.

Table 9. Results of diagnoses on organs and dead and live animals - Deer

Name of disease and pathologic states	Jan. 1979/'80 Dead and live animals (DLA)	1980/'81 DLA	1980/'81 Organs	1981/'82 DLA	1981/'82 Organs	Total
Pneumonia parasitica			1/1			1/1
Pneumonia bronchialis			1/1			1/1
Total			2/2			2/2

Comments: Numerator means number of specimens, and denominator number of applicants, respectively.

Table 10. Results of diagnoses on organs and dead and live animals - sheep and goats

No. of applicants	Diagnosis rate (%)	Name of disease and pathognomonic signs	Jan. 1979/'80 Dead and live animals (DLA)	1980/'81 DLA	1980/'81 Organs	1981/'82 DLA	1981/'82 Organs	Total	
Infectious diseases		Rabies			1/1*1			1/1	
		Contagious pustular dermatitis	1/1		(1/1)		(1/1)*2	(1/1)	1/1
		Bluetongue-like disease						(1/1)	
5	29.4	Contagious kerato conjunctivitis	1/1						1/1
Parasitic diseases									
3	17.6	Haemonchiasis		(1/1)	1/1	1/1		(1/1)	2/2
		Pneumonia catarrhalis		(1/1)				(1/1)	
		Pneumonia brochialis			2/1				2/1
		Pneumonia purulenta			3/2				3/2
		Malnutritional cachexia							2/2
		Peritonitis serofibrinoza				2/2		(1/1)	
		Pyometra			(1/1)				2/1
9	52.9	Pappiloma			1/1	2/1			1/1
17	100	Total	2/2	(2/2)	1/1 (1/1) 7/5	(1/1)	5/4 (1/1)	(5/5)	15/12

Comments: *1 numerator means number of specimens, and denominator number of applicants, respectively.

**2 ( ) means sheep.

Table 11. Results of diagnoses on organs and dead and live animals - swine

No. of applicants	Diagnosis rate (%)	Name of disease and pathognomonic signs	Jan. 1979/'80 Dead and live animals	1980/'81 Dead and live animals	Organs	1981/'82 Dead and live animals	Organs	Total
Infectious diseases		Hemorrhagic septicemia (Swine pasteurellosis)		7/3		3/1		10/4
5	41.7	Coli bacteriosis	1/1					1/1
Parasitic diseases		Ascariasis	2/2					2/2
		Swine kidney worm disease		1/1				1/1
4	33.3	Milky spot of liver			1/1			1/1
Others		Pleure-peritonitis serofibrinoza				1/1		1/1
		Death due to hernia	1/1					1/1
3	25.0	Death due to malnutrition	2/1					2/1
12	100	Total	6/5	8/4	1/1	4/2		19/12

Comments: * Numerator means number of specimens and denominator number of applicants, respectively.

Table 12. Results of diagnoses on organs, and dead and live animals - chickens and ducks

No. of applicants	Diagnosis rate (%)	Name of disease and pathognomonic signs	Jan. 1979/'80 Dead and live animals (DLA)	1980/'81 DLA	1980/'81 Organs	1981/'82 DLA	1981/'82 Organs	Total
Infectious disease		Newcastle disease	157/12*1	7/4		43/11		207/27
		Avian lymphoid leukosis	2/2	7/4		9/5		18/11
		Marek's disease	1/1	9/3		5/2		15/6
		Fowl pox	1/1		2/1			3/2
		Infectious bursal disease					1/1	1/1
		Coli bacteriosis				1/1		1/1
		Chronic respiratory disease		11/5		9/5		20/10
		Pullorum disease		1/1				1/1
		Leucocytozoonosis		3/1		1/1		4/2
68	58.6	Coccidiosis	11/4	5/1		1/1	1/1	18/7
Parasitic disease		Ascariasis	4/2	1/1		13/5		18/8
9	7.8	Tapeworm disease				1/1		1/1
Diseases of alimentary		Enteritis catrarrhalis		5/2		5/3		10/5
		Enteritis haemorrhagica et hecrotica				1/1		1/1
		Fatty liver		(3/1)*2				(3/1)
9	7.8	Hepatitis		(1/1)		(2/1)		(3/2)
Disease of respiratory organ		Pneumonia bronchialis		(2/1) 6/1		2/2		(2/1) 3/3
		Peritonitis serofibrinoza		1/1		2/1		3/2
4	3.4							

Table 12. Continued

No. of applicants	Diagnosis rate (%)	Name of disease and pathognomonic signs	Jan. 1979/'80 Dead and live animals (DLA)	1980/'81 DLA	1980/'81 Organs	1981/'82 DLA	1981/'82 Organs	Total
		Rupture of ovarian follicle and peritonitis				2/1		2/1
		Hemorrhagic diathesis		1/1				1/1
		Myositis purulenta				3/1		3/1
Others		Arthritis purulenta				1/1		1/1
		Abscess of eye		1/1				1/1
		Malnutrition		5/3				5/3
		Gout				2/2		2/2
		Cannibalism				2/2		2/2
		Feed poisoning				14/4		14/4
		Hepatoma				1/1		1/1
		Adenocarcinoma in peritoneal cavity				1/1		1/1
21	18.1	Sarcoma		1/1				1/1
5	4.3	Could not diagnose		2/2		(1/1) 2/2		(1/1) 4/4
116	100	Total	176/22	(6/3) 66/32	2/1	(3/2) 121/54	2/2	(9/5) 367/111

Comments: *1 Numerator means number of specimens, and denominator number of applicants, respectively.

*2 ( ) means ducks.

Table 13. Results of diagnoses on organs, and dead and live animals - dogs and cats

No. of applicants	Diagnosis rate (%)	Name of disease and pathognomonic signs	Jan. 1979/'80 Dead and live animals (DLA)	1980/'81 DLA	1980/'81 Organs	1981/'82 DLA	1981/'82 Organs	Total
Infectious disease		Rabies	7	4	5	5	(3)* 119	(3) 140
144	94.1	Leptospirosis				1		1
		Anchylostomiasis	1			2		3
Parasitic diseases		Tapeworm disease				2		2
		Ascariasis	1					1
		Trichuriasis	1					1
		Paragonimiesis	1					1
9	5.9	Demodex. Sarcoptes infection					1	1
153	100	Total	11	4	5	10	(3) 120	(3) 150

Comments: * ( ) means cats.

Table 14. Results of Brucella rapid agglutination test in cattle and buffalo

Period	Total No. of cattle examined	Positive No. of cattle
Jan. 1979/'80	1,451	15

Period	No. of cattle	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1980/'81	Total No.	145	119	47	99	106	271	104	(10)* 191	96	78	156	98	(10) 1,510
	Positive No.													(0) 0
1981/'82	Total No.	91	284	338	160	83	100	496	(4) 562	(4) 313	453	265	(3) 156	(39) 3,301
	Positive No.		8		1			1			4	2	26	(0) 42

Comments: * ( ) means buffalo.

Table 15. Results of Brucella rapid agglutination test in sheep and goats

	Sheep		Goats	
Period	Total No. examined	Positive No.	Total No. examined	Positive No.
1980/'81			46	0
1981/'82	39	0	93	1

Table 16. Final decision of cattle and goats which were positive in Brucella rapid agglutination test

Date examined	Animals	No. of positive cases in rat	Decision (T.A.T.*1 and C.F.T.*2) Diseased animals (head)	Suspected animals (head)	Healthy animals (head)	Unknown (head)
May, 1981	Imported cattle	8	1	3	2	2
July, 1981	"	1			1	
Oct., 1981	"	1	1			
Jan., 1982	"	4		1	3	
Feb., 1982	"	2	1	1		
	"	25	17	2	6	
Mar., 1982	native cattle	1			1	
	goat	1			1	

Comments: *1 T.A.T.: Tube agglutination test.

*2 C.F.T.: Complement fixation test.

Table 17. Results of Salmonella pullorum and Mycoplasma gallisepticum rapid agglutination tests

Period	Total No. of chickens examined	No. of positive cases	
		S. pullorum	M. gallisepticum
Jan. 1979/'80	1,031	72	63

Period	Number of chickens		Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1980/'81	Total No. examined		22	52	57	103	130	40	235	53	370	297	120	80	1,559
	Positive cases	S. pullorum				1					1				2
		M. gallisepticum	6	5	37	14	27	18	33			19	41	30	230
1981/'82	Total No. examined		140	410	627	66	604	40	246	459	327	170	668	221	3,978
	Positive cases	S. pullorum		22			3			3	25	9	47	26	135
		M. gallisepticum	31	58	127	7	25	6	113	82	170	138	668	214	1,639

Table 18. Investigations of antibody against Newcastle disease virus by use of hemoagglutination inhibition (H.I) test.

Period		Districts of investigation in Lampung Province														
		North Lampung			Central Lampung			South Lampung			T. Karang T. Betung			I. Chicken *1 Farm		
Year	Month	No. of appli cants *3	Titer of HI antibody ≦ 64	> 64	No. of appli cants	Titer of HI antibody ≦ 64	> 64	No. of appli cants	Titer of HI antibody ≦ 64	> 64	No. of appli cants	Titer of HI antibody ≦ 64	> 64	No. of appli cants	Titer of antibody ≦ 64	> 64
	Sep.							3	0	3						
	Oct.				5	1	4	4	0	4						
	Nov.															
	Dec.							3	2	1	3	3	0			
	Jan.							2	0	2						
	Feb.				2	0	2	3	1	2						
	Mar.							3	2	1	7	6	1			
	Apr.										3	2	1			
	May										2	2	0			
1980	Jun.															
	Jul.				7	4	3									
	Aug.							5	3	3						
	Sep.										4	4	0			
	Oct.										14	9	5			
	Nov.										1	1	0			
	Dec.	5	4	1	13	8	5	8	3	5	9	7	2			
	Jan.				19	11	8							4	2	2
	Feb.										4	1	3	5	2	3
	Mar.													3	2	1
	Apr.							6	1	5	3	3	0	5	1	4
1981	May							11	5	6	7	2	5			
	Jun.							9	6	3				8	0	8
	Jul.							11	7	4	9	5	4	5	2	3
	Aug.				1	1	0				11	10	1	1	0	1
	Sep.	3	2	1												
	Oct.				12	11	1	6	3	2	2	1	1			
	Nov.										6	5	1	3	3	0
	Dec.	3	3	0	6	3	3	12	10	2						
	Jan.	6	4	2										6	4	2
1982	Feb.	1	0	1				16	8	8	11	3	8	5	3	2
	Mar.	4	2	2	9	6	3							2	1	1

*1 Big chicken farm where 20,000 chicken have been raised.

*2 GM value.

*3 Serum of 10 chickens were taken in one applicant.

Table 19. Serum protein content in cattle

Period	Number of cattle	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1980/'81	Total No. examined	139	113	113	79	106	189	85	79	61	63	94	71	1,192
	No. of cattle showing abnormal value	20	22	6	10	16	16	8	13	15	9	13	2	150
1981/'82	Total No. examined	133	226	305	129	134	72	133	170	-	-	-	-	1,302
	No. of cattle showing abnormal value	15	11	8	8	4	3	34	-	-	-	-	-	83

Comments: Abnormal value of serum protein content is less than 6.0% in this instance.

Table 20. Hematocrit value in blood of cattle

Period	Number of cattle	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1980/'81	Total No. examined	137	99	109	59	75	256	77	93	57	56	24	66	1,108
	No. of cattle showing abnormal value	8	3	8	6	3	7	3	8	4	3	1	1	55
1981/'82	Total No. examined	99	220	111	42	147	72	41	-	-	-	-	-	732
	No. of cattle showing abnormal value	2	7	4	5	20	1	4	-	-	-	-	-	43

Comments: Abnormal value of Hematocrit is less than 20% in this instance.

Table 21. Examination of protozoa in blood smears of cattle and buffalo

Period	Total No. of cattle examined	No. of cattle positive in protozoa			
		Trypanosoma sp.	Theileria sp.	Babesia sp.	Anaplasma sp.
Jan. 1979/'80	1,332 (1)*	9 (0)	58 (0)	10 (0)	3 (0)

Comments: ( ) means buffalo.

Period	No. of cattle		Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1980/'81	Total No. examined		182	122	125	117	145	(13) 343	200	(11) 222	162	110	166	(5) 139	(24) 2,033
	No. positive in protozoa	Trypanosoma sp.			2	5	1			(1) 2	2		3	(1)	(2) 15
		Theileria sp.	6	1	9		4	(2) 11	5	5	3	1	30	2	(2) 77
		Babesia sp.													(0) 0
		Anaplasma sp.				1		6	5	3					0 15
1981/'82	Total No. examined		162	313	187	356	(8) 144	99	196	489	308	439	278	(33) 159	(41) 3,130
	No. positive in protozoa	Trypanosoma sp.						1	2	3				3	(0) 9
		Theileria sp.	1	24	1		1	1	31	6	7	5		7	(0) 84
		Babesia sp.												2	(0) 2
		Anaplasma sp.		6			(3) 3		1			7	1	1	(3) 19

Table 22. Examination of protozoa in blood smears of chickens

Period	Total No. of chickens examined	No. of chickens positive in protozoa		
		L. caulleryi	L. sabrasezi	Trypanosoma sp.
Jan. 1979/'80	326	3	0	0

Period	Number of chickens		Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1980/'81	Total No. examined		31	41	31	85	72	22	232	57	172	244	124	85	1,196
	No. positive in protozoa	L. caulleryi	2									1		1	4
		L. sabrasezi									3	38	8		49
		Trypanosoma sp.													0
1981/'82	Total No. examined		138	222	463	86	452	302	238	393	269	158	682	244	3,647
	No. positive in protozoa	L. caulleryi	1	2	12		8	1	3	7	5	4	3		46
		L. sabrasezi								4	3	17	3	10	37
		Trypanosoma sp.								1					1

Table 23. Detection of helminth by examination of parasitic eggs contained in feces of cattle

Period	Total No. of cattle examined	Paramphistomum sp.	Fasciola sp.	Bunostomum sp.	Cooperia sp.	Oesophagostomum sp.	Strongyloides sp.	Trichuris sp.
Jan. 1979/'80	1,257	313	146	47	129	17	4	28

Period	Number of cattle		Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
	Total No. examined		107	105	106	111	71	245	189	192	107	82	69	87	1,471
1980/'81	No. positive in parasitic eggs	Paramphistomum sp.	28	10	8	15	2	25	16	7	7	14	6	6	144
		Fasciola sp.	8	3	6	12	3	8	9	12	3	7	1	5	77
		Bunostomum sp.	3	2	2	10	5	8	10	7	7	4	3	2	63
		Cooperia sp.	26	13	7	15	7	10	5	16	17	7	8	6	137
		Oesophagostomum sp.	5	5	1	8		1	1	26	9	7	7	6	76
		Strongyloides sp.								1	1	1	1	1	5
		Trichuris sp.	6	2	2	7	2	3	2	2	3	6	4	4	43
		Haemonchus sp.									2			1	3
		Nematodirus sp.												1	1
		Ascaris sp.							4		2	1	3	2	12
		Syngamus sp.						1		1					2
		Trichostrongylus sp.							1						1

Table 23. Continued

Period	Number of cattle		Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
	Total No. examined		150	309	338	126	191	65	157	443	312	380	287	117	2,860
1981/'82	No. positive in parasitic eggs	Paramphistomum sp.	4	35	15	7		1	3					6	71
		Fasciola sp.	6	11	5		9		4	23	106	84	28	39	315
		Bunostomum sp.	5	5	15	1	2	1	7	6	1	14	11	3	71
		Cooperia sp.	31	43	55	28	32	10	10	58	1	84	40	26	418
		Oesophgostomum sp.	9	105	34	32	24	6	12	47	22	71	43	22	427
		Strongyloides sp.	3	14	2	4	7		2	7		3	7		49
		Trichuris sp.	7	8	2			1	5		1	1			25
		Haemonchus sp.					24			8	1		1		34
		Nematodirus sp.		5	1	6	1	1		5	1		1		21
		Ascaris sp.	1	1	1	4								1	8
		Syngamus sp.													
		Trichostrongylus sp.													

Table 24. Detection of eggs of Ascaridia galli in feces of chickens

Period	Jan. 1979/'80	Total No. of chickens examined	51	No. of chickens positive in parasitic eggs	51

Period	Number of chickens	Apr.	May	Jun.	Jul.	Aux.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1980/'81	Total No. examined	4	4	23	7	8	2	55	33	21	60	8	5	230
	No. positive in parasitic eggs			1	7	6	2	43	12	8	4			83
1981/'82	Total No. examined	13	38	48	66	47	8	16	41	22	13	73	23	408
	No. positive in parasitic eggs	5	21	29		16		4	13	6	3	43	7	147

Table 25. Viruses identified by virology section

Kind of viruses	Kind of animals	Virus isolation	FAT
Rabies virus	Goats		+
	Dogs		+
	Cats		+
	Monkeys		+
Newcastle disease virus	Chickens	+	+
Avian bronchitis virus	Chickens		+

Comments: *FAT ..... Fluorescent antibody technique.

Table 26. Viral antigens and antibodies detected by virology section of DIC

Viral disease	Serological test	Kind of animals			
		Cattle	Buffalo	Swine	Chickens
Japanese encephalitis	HI test	+	+	+	
Akabane disease	"	+			
Parainfluenza type 3	"	+			
Newcastle disease	HI test				+
	HA test				+

Comments: HI test ..... Hemoagglutination inhibition test

HA test ..... Hemoagglutination test

Table 27. Bacteria and fungus identified by Bacteriology Section of DIC

	Name of Bacteria isolated	Cattle	Buffalo	Sheep	Goats	Swine	Chickens	Dogs	Rabbits	Others
Gram-negative bacteria	Bacteroides sp.	+								
	Neisseria sp.				+					
	Branhamella sp.	+								
	Acinetobacter sp.				+					
	Bordetella sp.	+	+							
	" bronchiseptica				+					
	Chromobacterium lividum					+				
	Alcaligenes sp.	+	+				+		+	
	Flavobacterium sp.	+					+			
	Pseudomonas sp.		+			+				
	" diminuta						+			
	" aerginosa						+			
	Pasteurella multocida	+	+			+				
	" haemolytica	+								
	Chromobacterium violaceum									+
	Escherichia coli	+	+	+	+	+	+	+	+	
	E. coli (OK I 026 : K60)	+								
	" (OK I 086a: K61)	+		+						
	" (OK I 0127a: K63)	+								
	" (OK II 0 146 : K89)	+								
	" (OK II 0 112ac : K66)	+								
	" (OK III 0 125^{a}_{b} : K70)						+			
	" (OK III 0 143 : KX1)	+								
	" (OK III 0 44 : K74)	+			+		+		+	
	Salmonella sp.	+								
	" Typhi	+								
	Shigella sp.	+					+	+		
	" sonnei	+								
	Proteus sp.	+			+	+	+		+	
	" mirabilis				+		+			
	Klebsiella sp.				+					

Table 27. Continued

	Name of Bacteria isolated	Cattle	Buffalo	Sheep	Goats	Swine	Chickens	Dogs	Rabbits	Others
Gram-negative bacteria	Klebsiella edwardsii					+	+			
	" aerogenes	+						+		
	" ozaenae				+					
	Enterobacter sp.	+				+				
	" aerogenes						+			
	Citrobacter sp.	+					+	+		
	" koseri			+	+					
	Yersinia sp.	+				+				
	Serratia sp.	+								
	" rubidaea						+			
	" marcescens	+								
	Edwardsiella tarda	+						+		
	Morganella morganii	+								
	Eikenella sp.	+								
	Streptobacillus sp.	+								
Gram-positive bacteria	Micrococcus sp.	+	+		+		+	+		
	" luteus				+					
	Staphylococcus sp.	+			+	+	+	+	+	+
	" aureus	+							+	
	Streptococcus sp.						+			
	" pneumoniae	+					+			
	Kurthia sp.	+								+
	Corynebacterium sp.	+								
	" pyogenes	+								
	" bovis	+								
	Lactobacillus sp.	+								
	Bacillus sp.	+	+		+	+	+	+	+	+
	" subtilis	+								+
	" cereus	+							+	
	Diplococcus sp.	+	+	+	+	+	+	+	+	+
Fungus	Aspergillus sp.	+								

Table 28. Bacterial antibodies detected by Bacteriology Section of DIC

Bacterial disease	Serological test	Kind of animal		
		Cattle	Goats	Chickens
Brucellosis	CFT*1	+		
	TAT*2	+		
	RAT*3	+	+	
Pullorum disease	"			+
M. gallisepticum infection	"			+

Comments: *1 CFT: Complement fixation test

*2 TAT: Tube agglutination test

*3 RAT: Rapid agglutination test

Table 29. Protozoa and endo- and ecto-parasites identified by Parasitology Section of DIC

	Name of protozoa and ecto- and endo- parasite	Cattle	Buffalo	Horse	Sheep	Goats	Swine	Chickens	Dogs	Monkeys	Rabbits
Protozoa	Trypanosoma sp.		+					+	+		
	" evansi	+									
	Anaplasma marginale	+									
	Theileria sp.	+	+								
	Babesia sp.	+									
	Leucocytozoon caulleryi							+			
	" sabrasezi							+			
	Eimeria sp.							+			+
	Sarcocystis sp.	+			+						
Endo-parasites	Bunostomum sp.	+									
	Cooperia sp.	+									
	Oesophagostomum sp.	+									
	Nematodirus sp.	+									
	Trichuris sp.	+									
	Ascaris vitulorum	+									
	" lumbricoides							+			
	" galli								+		
	Strongylus vulgaris				+						
	Haemonchus contortus					+	+				
	" placei	+									
	Strongyloides sp.					+	+				
	Ankylostoma sp.									+	
	" caninum								+		
	Toxocara canis								+		
	Raillietina sp.							+			
	Paramphistomum servi	+									
	Gastorothylax erumeniver		+								
	Stephanurus dentatus							+			
	Setaria sp.	+									
	Stephanofilaria sp.	+									
	Dictiocaulus viviparus	+									

Table 29. Continued

	Name of protozoa and ecto- and endo- parasite	Cattle	Buffalo	Horse	Sheep	Goats	Swine	Chickens	Dogs	Monkeys	Rabbits
Endo-parasites	Dipylidium caninum								+		
	Fasciola hepatica	+	+								
	Boophilus microphrus	+									
	Stomoxys sp.	+									
	Tabanus sp.	+									
	Musca sp.	+									
	Chrysops sp.	+									
	Sarcopts scabei					+	+			+	
	Culicoides sp.							+			

Table 30. Protozoal antibodies detected by Parasitology Section of DIC

Genus of protozoa	Serological test	Kind of animal		
		Cattle	Swine	Chickens
Anaplasma marginale	CFT*1	+		
Toxoplasma	Ratex AT*2		+	
Leucocytozoon caulleryi	AGT*3			+

Comments: *1 CFT : Complement fixation test
*2 Ratex AT : Ratex agglutination test
*3 AGT : Agar-gel immunodiffusion test

Table 31. Main pathological changes of Rama Dewa disease occurring in Lampung Province in the period from 1980 to 1982

No. of Bali cattle	Date of autopsy	Sex	Age (Month)	Main pathological changes							Names of village, and subdistrict where Rama Dewa disease occurred
				Erosion and ulcer of tongue, palate and pharynx	Erosion and ulcer of upper respiratory tract	Proliferation of lymphoid cells					
						Liver	Spleen	Lymph nodes	Lung	Kidney	
No. 1	23rd, Aug. 1980	F	30	+	++	+++	++	+++	++	+	Astomulyo, Central Lampung
No. 2	6th, Oct. 1980	M	6	+++	++	+++	+++	+++	+++	++	Sidomulyo, Central Lampung
No. 3	18th, Nov. 1980	M	7	+	-	++	++	++	++	+	Rama Gunawan, Central Lampung
No. 4	17th, Dec. 1980	F	48	+	-		++	++	+++	+++	Rama Utama, Central Lampung
No. 5	18th, Dec. 1980	F	30	+++	+	++		++	++	++	Rama Gunawan, Central Lampung
No. 6	7th, May 1981	F	36			++	++		+	+	Astomulyo, Central Lampung
No. 7	22nd, Jan. 1982	F	24	+	+	++	+	+	-	+	Tanjungkarang-Telukbetung
No. 8	1st, Feb. 1982	F	30	+++	++	++	++	++	+	++	" "

Comments: F: female M: male
+++: severe
++: moderate
+: slight
-: negative

Table 32. Main pathological changes and bacteriological gindings of Swine pasteurellosis occurring in Lampung Province

No. of Swine	Date of Autopsy	Age (Month)	Main pathological changes					Findings of pasteurella multocida						Name of subdistrict attached
			Erythema	Subcutaneous edema	Edema of pharynx larynx	Pneumonia serofibrinosa	Cogention & hemorrhage of intestine	Heart blood	Submaxillar Lymph node	Spleen	Liver	Kidney	Lung	
No. 1	8th, Jan. 1981	2.5	+++	+++	+	-	++	+++	+++	+++	++	+++	+++	Kedaton, South Lampung
No. 2	10th, Jan. 1981	8.0	+++	+++	+++	-	+++	+++	+++	-	+++	-	+++	Gedong Tataan, South Lampung
No. 3	"	"	+++	+	+	+++	+	+++		+++	+++	+++	+++	
No. 4	"	"	+++	+	+	++	+++			+++	+++	+++	+++	
No. 5	"	"	5.0	-	++	++	++	+	-	+++	-	-	-	-
No. 6	16th, Jan. 1981	2.0	+++	+++	+++	+++	++	+++	+++	+++	+++	+++		
No. 7	2nd, Oct. 1981	"	+	+	++	-	-	+++	+	++	+++	+	+++	Seputih Raman, Central Lampung
No. 8	"	"	+	+	++	-	-	+++	+	+++	++	+	+++	

Comments: +++: severe
++: moderate
+: slight
-: negative

Table 33. Investigations of Leucocytozoon by use of blood-smear method and agar-gel immunodiffusion test

Name of chicken farm	Date of examination	Total No. examined		No. positive in Leucocytozoon				No. of chickens raised in chicken farm	Subdistricts where chicken farm situate
				L.c.		L.s.			
		BS	Serum	BS	AGT	BS	AGT		
A	2nd, Feb. 1981	40	40	-	-	15	-	375	
B	" "	16	16	-	-	2	-	155	Terbanggi Besar, Central Lampung
C	" "	38	38	-	-	3	-	380	
D	" "	20	20	-	-	4	-	400	
E	" "	30	30	-	-	14	-	1,650	
F	2nd, May 1981	98	94	7	15	-	-	945	Natar, South Lampung
G	" "	30	30	3	3	-	-	700	Pringsewu, South Lampung
H	" "	50	50	-	-	-	-	2,500	T. Karang - T. Betung
I	" "	16	30	1	2	-	-	300	Gading Rejo, South Lampung
J	" "	25	40	-	14	-	-	480	T. Karang - T. Betung

Comments: BS: blood smear
L.c: Leucocytozoon caulleryi
L.s: Leucocytozoon sabrasesi
AGT: agar-gel immunodiffusion test

Table 34. Occurrence of rabies of animals in region of DIC in the period from August 1979 to March 1982

	1979/'80			1980/'81									1981/'82														
	Dogs			Dogs			Cats			Goats			Dogs			Cats			Monkeys			Wild swine			Cattle		
	No. exam. *1	No. pos. *2	Ratio pos. (%) *3	No. exam.	No. pos.	Ratio pos. (%)	No. exam.	No. pos.	Ratio pos. (%)	No. exam.	No. pos.	Ratio pos. (%)	No. exam.	No. pos.	Ratio pos. (%)	No. exam.	No. pos.	Ratio pos. (%)	No. exam.	No. pos.	Ratio pos. (%)	No. exam.	No. pos.	Ratio pos. (%)	No. exam.	No. pos.	Ratio pos. (%)
Apr.				1	1	100							10	8	80.0												
May													17	11	64.7							1	0	0			
Jun.													6	4	66.7												
Jul.				1	0	0							17	11	64.7	1	1	100									
Aug.	3	1	33.3	4	1	25.0							9	4	44.4	1	1	100							1	0	0
Sep.	3	1	33.3	3	0	0							13	8	61.5	3	1	33.3	1	1	100						
Oct.	1	0	0	4	0	0							16	11	68.8												
Nov.	1	1	100	3	1	33.3							24	17	70.8				1	0	0						
Dec.	3	2	66.7	1	0	0							24	19	79.2												
Jan.	2	1	50.0	5	1	20.0	1	0	0	1	1	100	11	10	90.9												
Feb.	2	1	50.6	4	1	25.0							14	9	64.3	1	0	0									
Mar.	1	0	0	9	5	55.6	1	0	0				15	12	80.0												
Total	16	7	43.8	35	10	28.6	2	0	0	1	1	100	176	124	70.5	6	3	50.0	2	1	50.0	1	0	0	1	0	0
Total	16	7	43.8	No. exam.	38	No. pos.	11	Ratio pos. (%)	28.9				No. exam.	186	No. pos.	128	Ratio pos. (%)	68.8									

Comments: *1 No. exam. ... No. of cases examined ; *2 No. pos. ... No. of positive cases ; *3 Ratio pos. ... Ratio of positive cases.

Table 35. Occurrence of rabies of animals in the provinces of Lampung, South Sumatra and Bengkulu

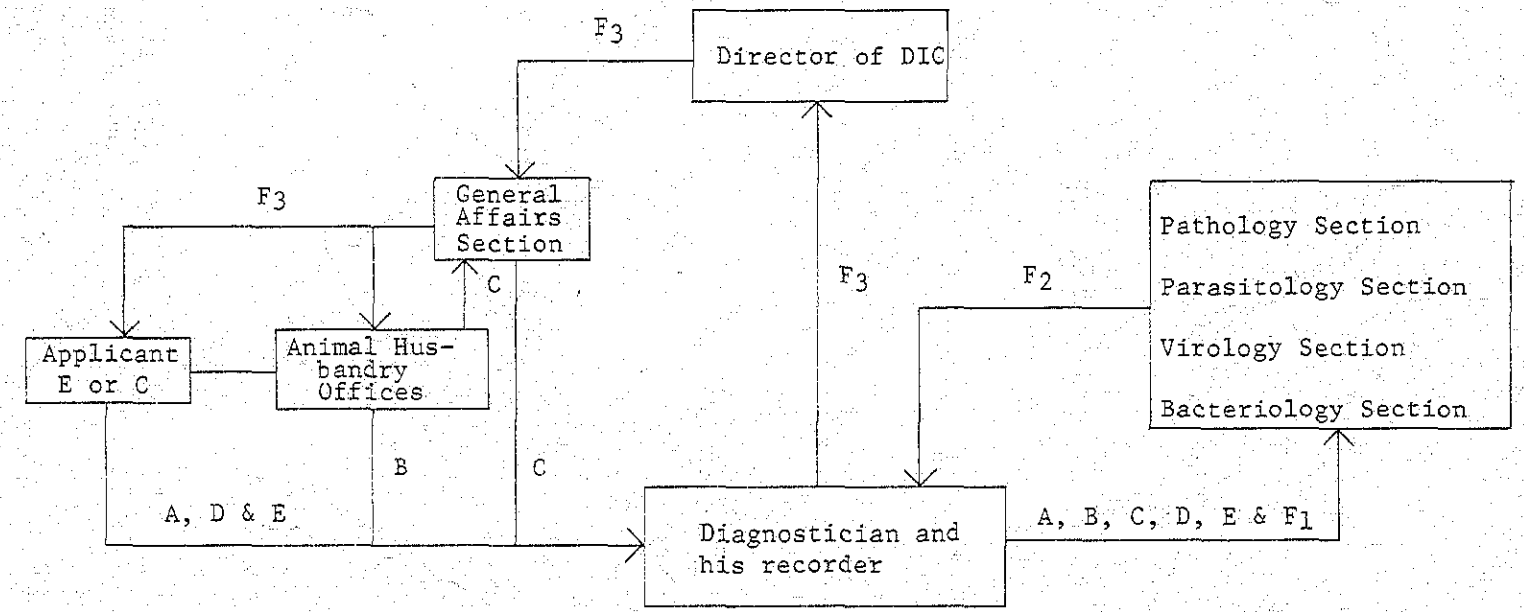
Province	1979/'80			1980/'81			1981/'82		
	No. exam. *1	No. pos. *2	Ratio pos. (%) *3	No. exam.	No. pos.	Ratio pos. (%)	No. exam.	No. pos.	Ratio pos. (%)
Lampung	9	3	33.3	22	6	27.3	56	33	58.9
South Sumatra	4	2	50.0	3	1	33.3	17	11	64.7
Bengkulu	3	2	66.7	13	4	30.8	113	84	74.3

Comments: *1 No. exam. ..... No. of cases examined

*2 No. pos. ..... No. of cases positive in Rabies

*3 Ratio pos. .... Ratio of positive cases

Fig. 1 Scheme of diagnostic services in DIC, Tanjungkarang



A : Specimens submitted to DIC from applicants.

B : Specimens submitted to DIC from applicants through Animal Husbandry Offices.

C : Specimens sent by mail from applicants through Animal Husbandry Offices.

D : Specimens collected by Survey Team of Animal Husbandry Offices and DIC.

E : Specimens collected by Survey Team of DIC.

F_1 : Blank Form model F-1.

F_2 : " " model F-2.

F_3 : " " model F-3.

Fig. 2 Subdistricts where Rama Dewa disease occurred in Lampung Province in the period from August 1980 to February 1982

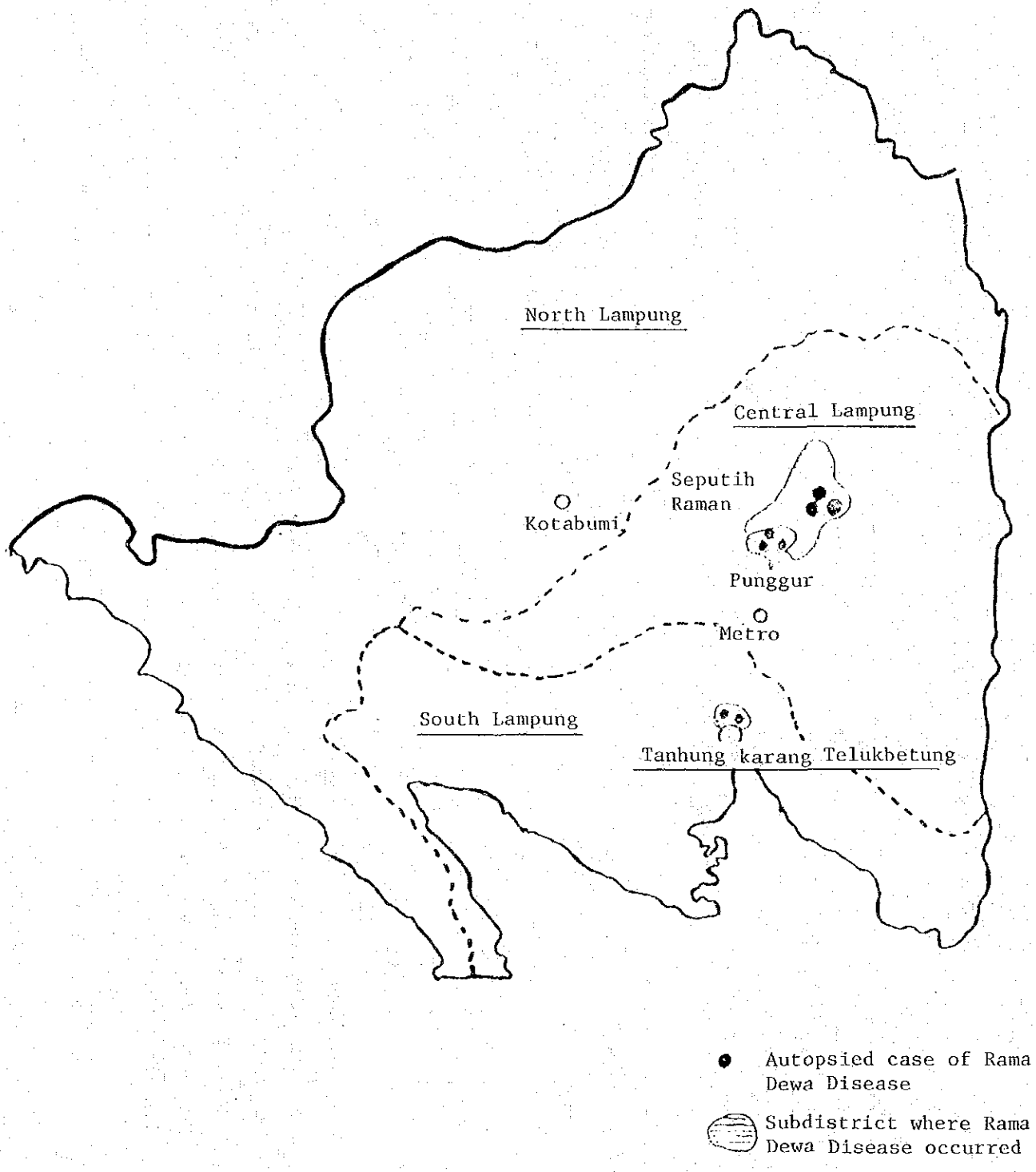
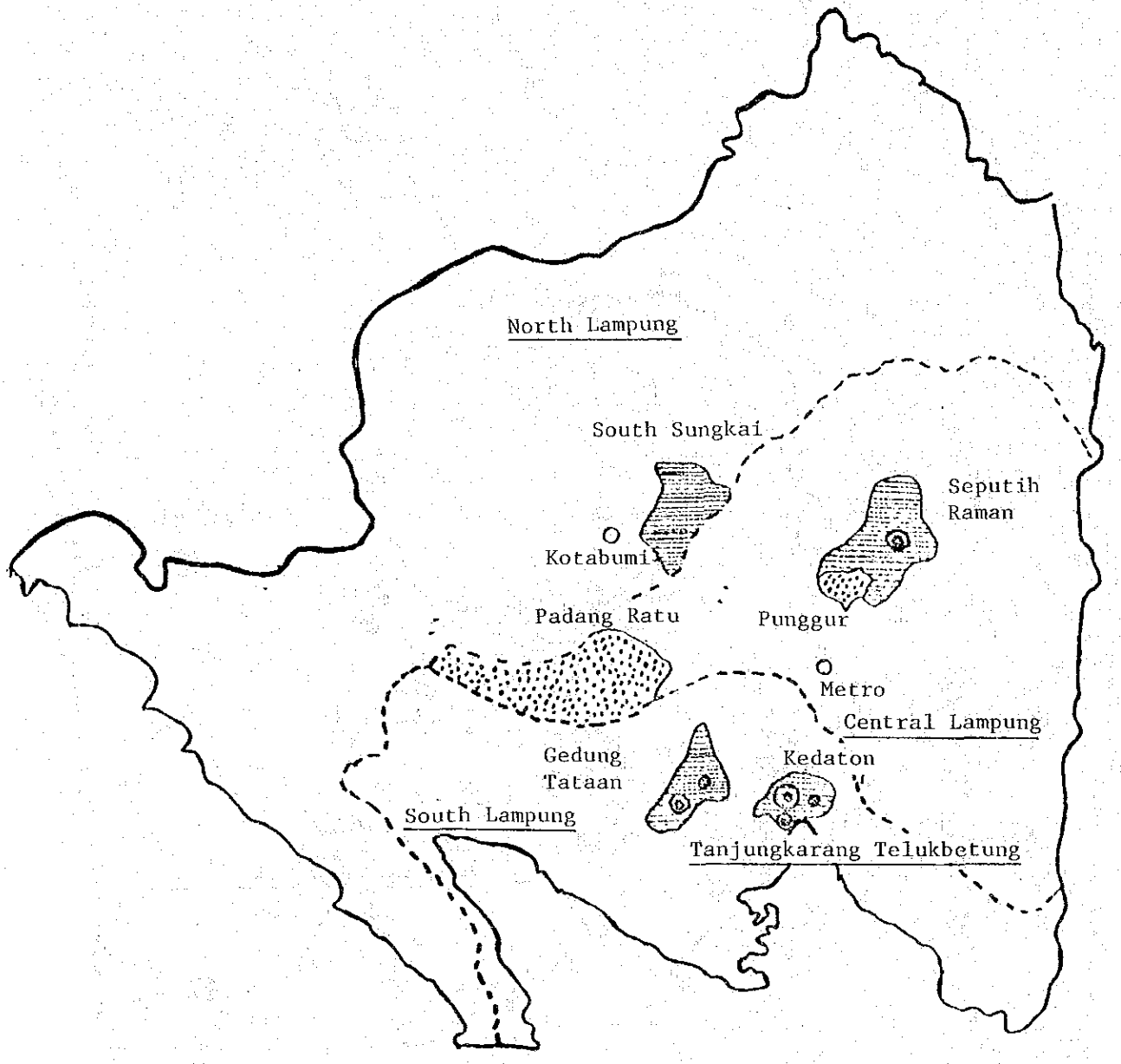


Fig. 3. Subdistricts where hemorrhagic septicemia of cattle and buffalo occurred in Lampung Province in the period from January 1979 to March 1982



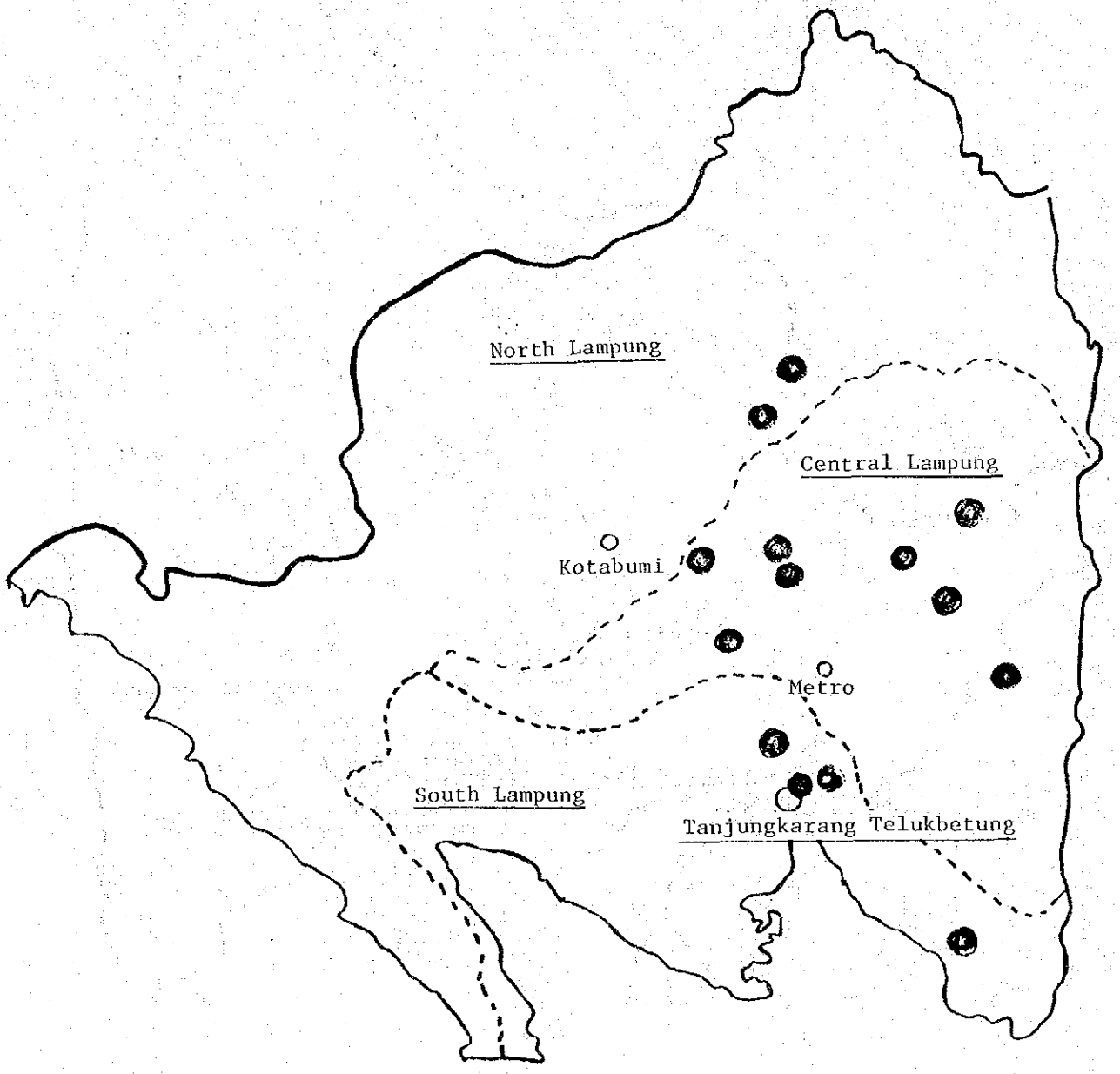
● Buffalo in which Pasteurella multocida was isolated.

◎ Swine in which Pasteurella multocida was isolated.

Subdistricts where hemorrhagic septicemia occurred Cattle, buffalo and swine.

Swine.

Fig. 4 Distribution of cattle and buffalo infected with Trypanosoma sp. in Lampung Province



Subdistricts where positive cases were present.

Fig. 5 Distribution of cattle and buffalo infected with Theileria sp. Babesia sp. in Lampung Province

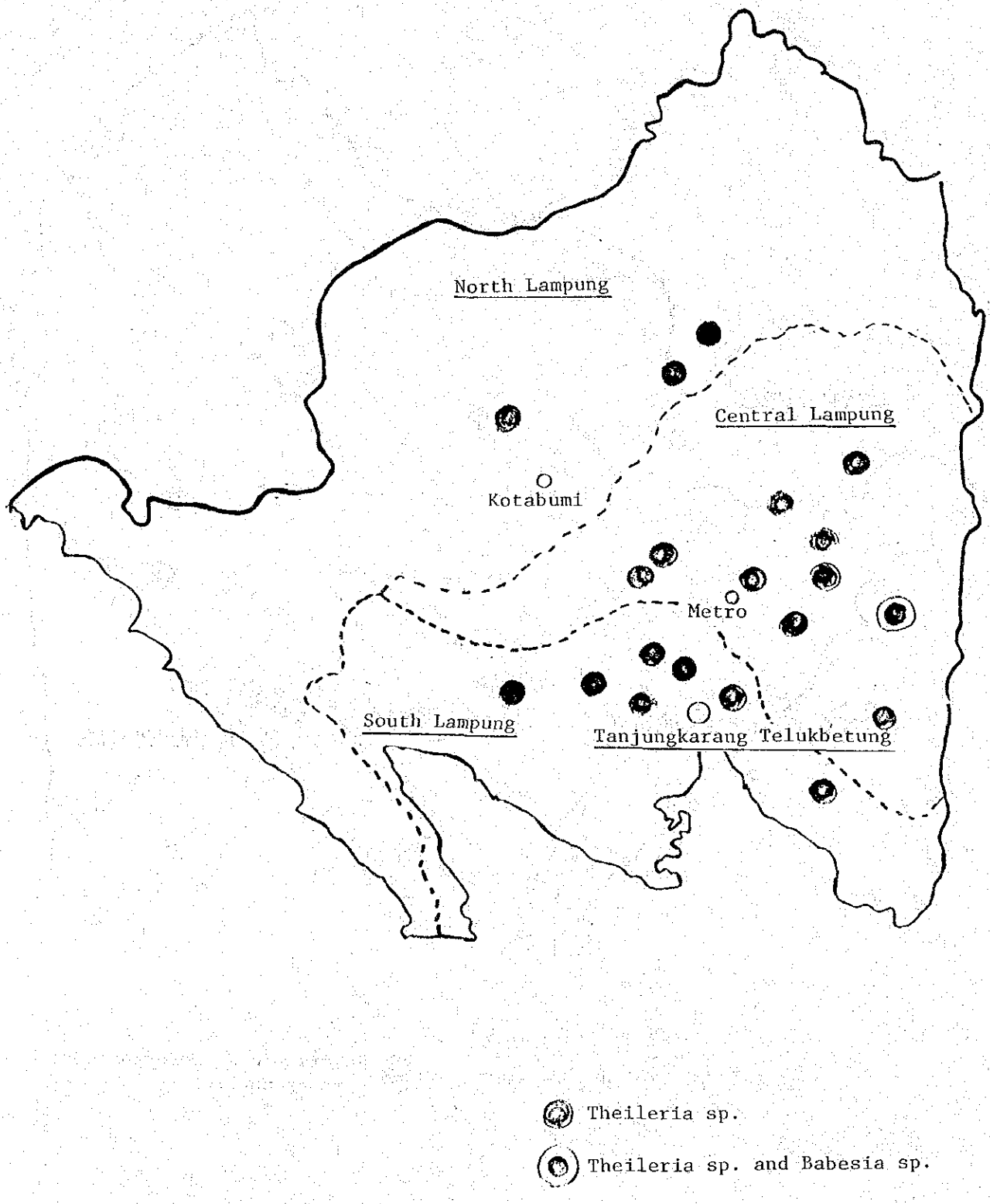
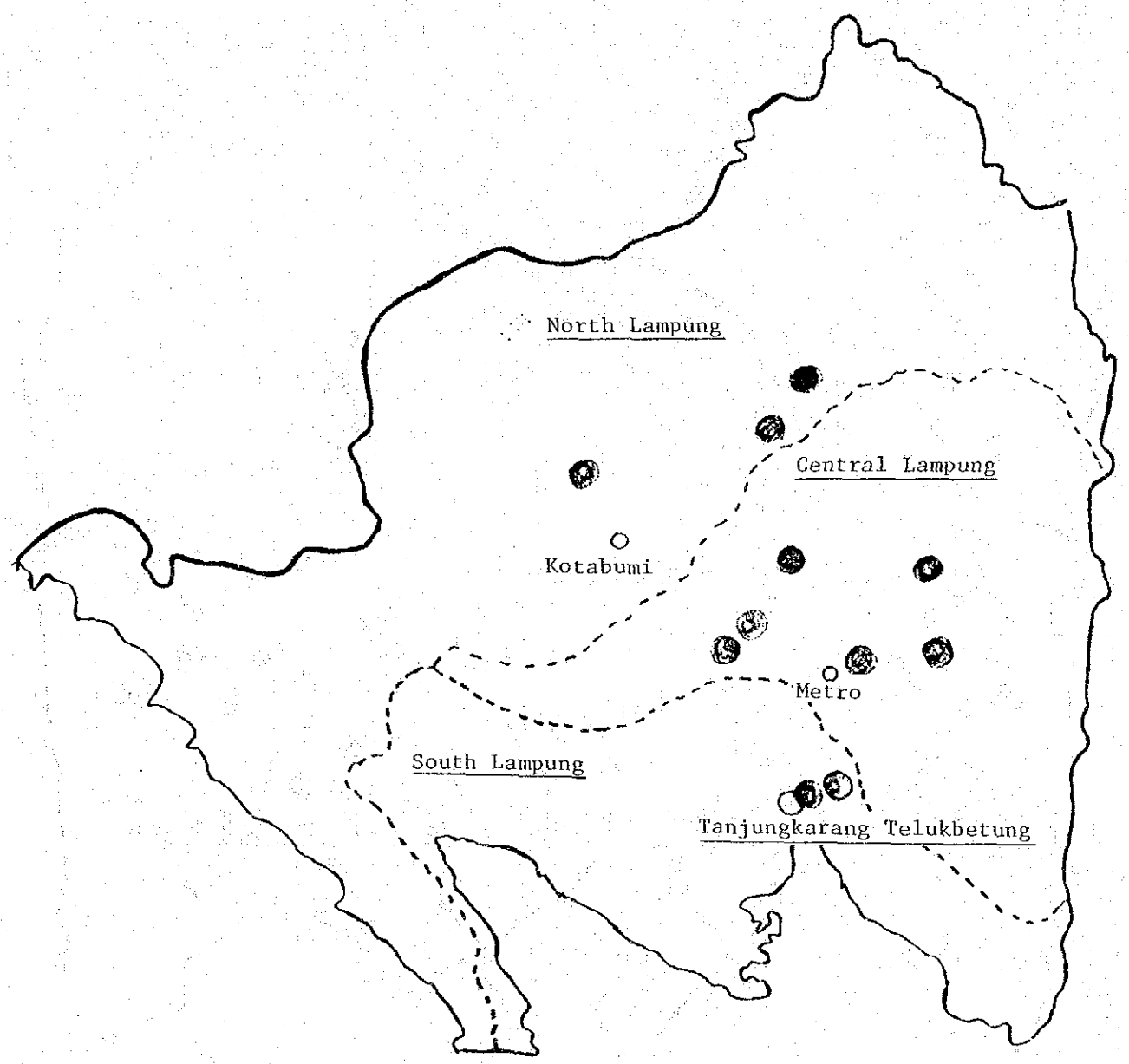


Fig. 6 Distribution of cattle and buffalo infected with Anaplasma sp. in Lampung Province



Subdistricts where positive cases were present.

Fig. 7 Distribution of chickens infected with Leucocytozoon caulleryi and L. sabrasesi in Lampung Province

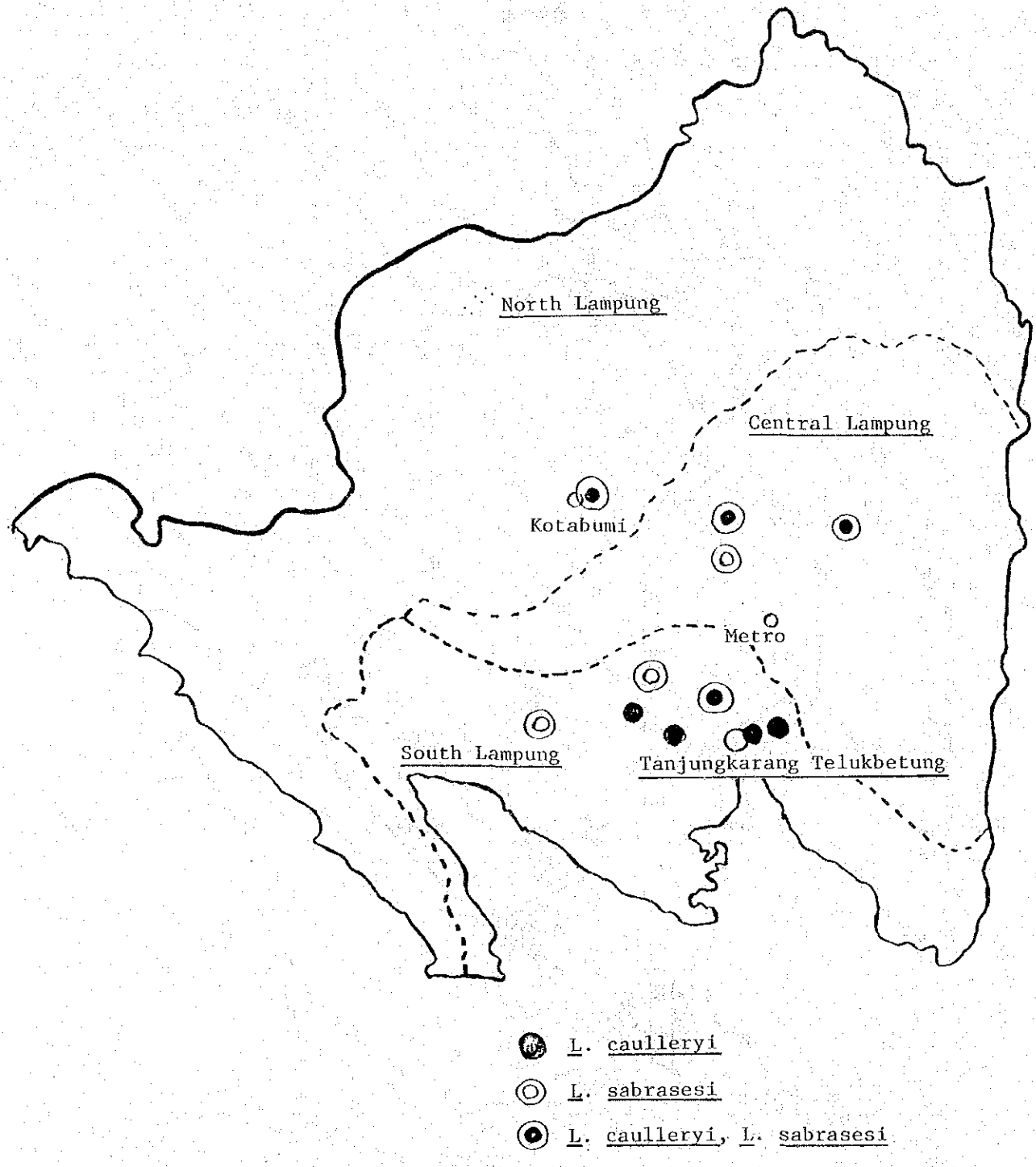
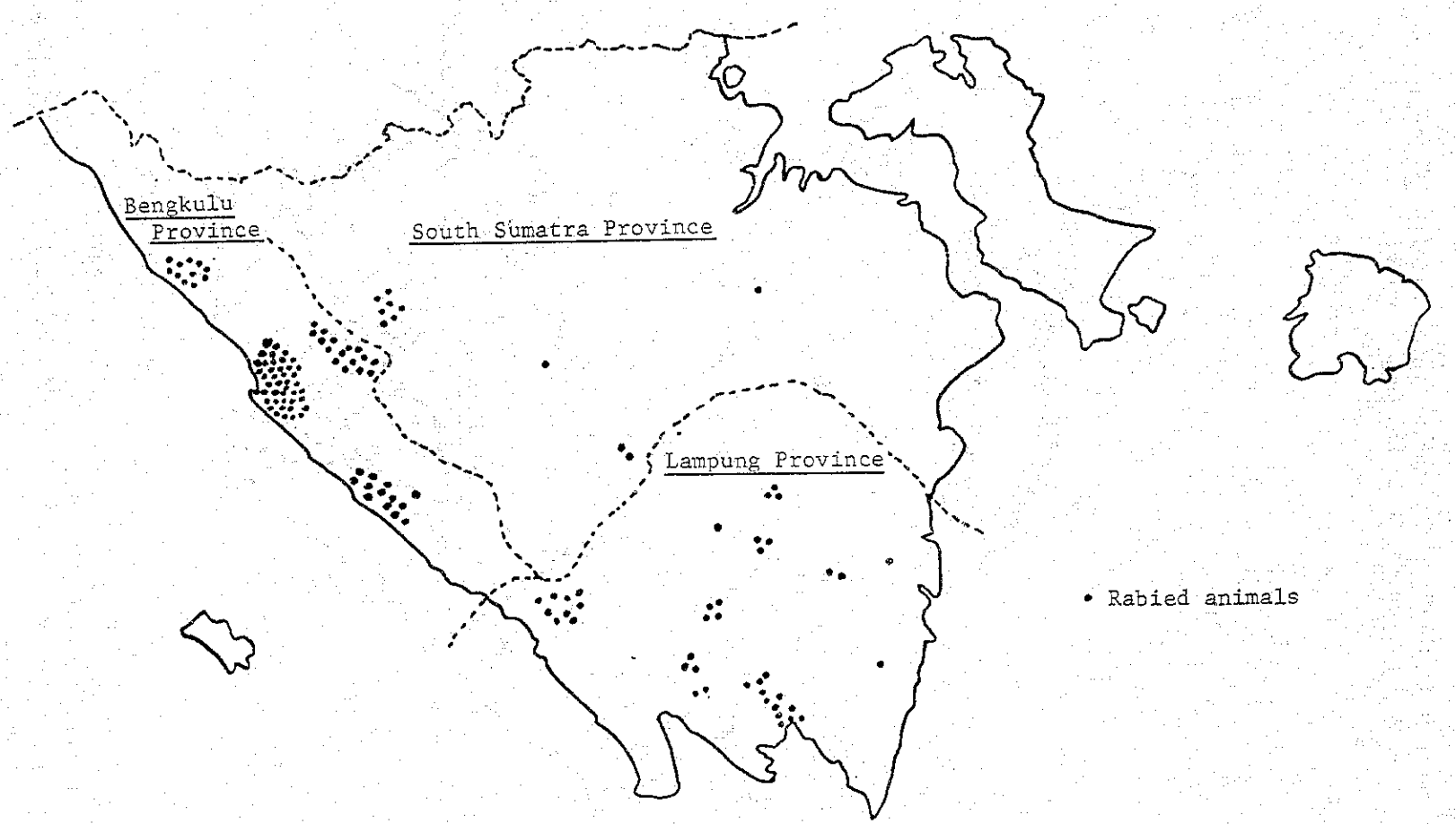


Fig. 8 Distribution of rabied animals in the provinces of Lampung, South Sumatra and Bengkulu



JAPANESE EXPERTS, CONTRIBUTORS TO THE PROJECT

I. Long Term Experts

(Medan)			(Tanjung Karang)		
Seiichi	Nagano	,	Ruizo	Ishitani	,
Yukio	Oshio	,	Kimiaki	Taguchi	,
Ikuo	Koike	,	Tamotsu	Ogata	,
Norikiyo	Yabe	,	Masashi	Ueda	,
Norihiko	Yoshida	,	Hiromi	Obara	,
Jun	Araki	,	Masahiro	Noda	,

II. Short Term Experts

Muneo	Ogata	,
Mituaki	Hayashi	,
Ichizo	Iwamoto	,
Junji	Yamaguchi	,
Eiichi	Senda	,
Yasuo	Miura	,
Toshitaka	Kono	,
Yoshio	Eiguchi	,