Annex 1 Schedule of Joint Evaluation for NAHPI Project

July 7, Wed. Arrival of Japanese Mission

8, Thu. Courtesy call to JICA office
Courtesy call to DTEC

9, Fri. Courtesy call to DLD
Joint evaluation meeting - 1. 10:00 - 12:00
at Siam City Hotel

10, Sat. Day off

11, Sun. Move to Pakchong

12, Mon. Survey of FMD Center
Back to Bangkok

13, Tue. Survey of NAHPI

14, Wed. Survey of NAHPI and preparation of Report

15, Thu. Joint evaluation meeting - 2. 09:00 - 17:00
at Siam City Hotel

16, Fri. Joint evaluation meeting - 3. 09:00 - 12:00
Discussion and singning of Report
at Siam City Hotel

17, Sat. Summarization of the result of the survey
at Siam City Hotel

18, Sun. Day off

19, Mon. Joint Committee Meeting at NAHPI. 14:00 - 16:00

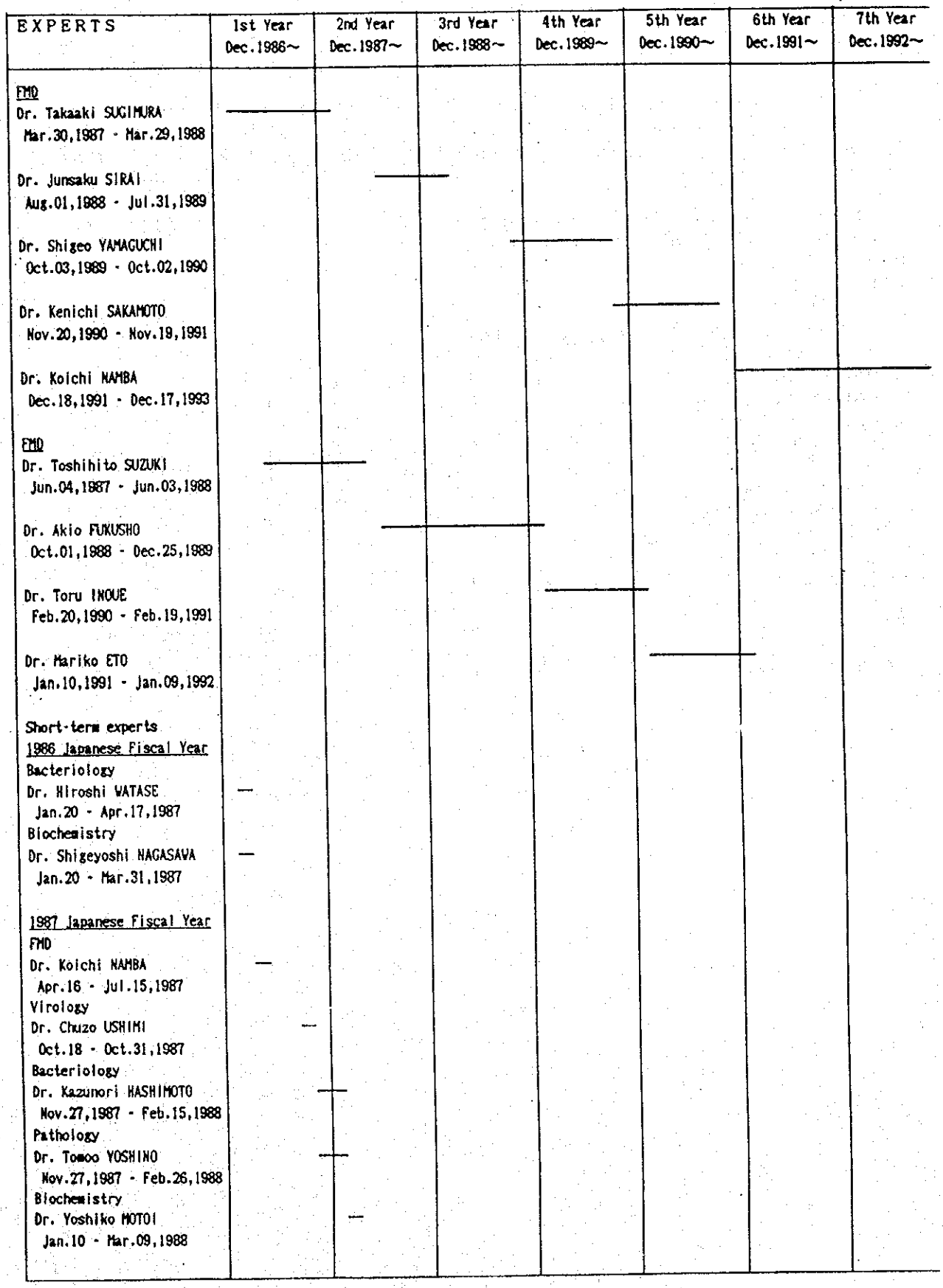
20, Tue. Report to MOAC
Report to JICA office
Departure of Japanese Mission

Annex 2

Number of experts assigned (Dec.,1986 - Dec., 1993)

Specialty	Long-term	Short-term
Leader	3	
Coordinator	2	1
NAHPI		
Virology	2	3(2)
Bacteriology	1	7
Pathology	2	4(1)
Parasitology	2	3
Biochemistry	2	6
Epidemiology		3
Experimental Animal		1
Maintenance		1
Foot-and-Mouth Disease Center	9	5
Total	23	34(3)

EXPERTS	1st Year Dec.1986～	2nd Year Dec.1987～	3rd Year Dec.1988～	4th Year Dec.1989～	5th Year Dec.1990～	6th Year Dec.1991～	7th Year Dec.1992～
Team leader							
Dr. Tamotsu ITO Dec.25,1986 - Dec.31,1987	———						
Dr. Chuzo USHIMI Feb.13,1988 - Jul.12,1989		———	———				
Dr. Tetsuo KUMAGAI Jun.19,1988 - Dec.09,1993			———	———	———	———	———
Coordinator							
Mr. Hiroshi MATOBA Jan.04,1987 - May 13,1987	—						
Mr. Yoshihiro SHIMIZU Oct.06,1988 - Dec.09,1991		———	———	———	———		
Ms. Yoshiko TANIGUCHI Nov.21,1991 - Dec.09,1993						———	———
Long-term experts							
<u>Virology</u> Dr. Koichi TAKEHARA Jan.20,1987 - Jan.19,1989	———	———	———				
Dr. Tomoaki MORIMOTO Jun.19,1989 - Dec.08,1991			———	———	———	———	
<u>Parasitology</u> Dr. Hiroaki NISHIKAWA Jan.20,1987 - Jan.19,1990	———	———	———	———			
Dr. Yusuke TADA May 24,1990 - Jul.09,1992					———	———	
<u>Pathology</u> Dr. Masashi MORIWAKI Jan.20,1987 - Jan.19,1989	———	———	———				
Dr. Shigemi SHOYA Nov.14,1989 - Dec.09,1993				———	———	———	———
<u>Biochemistry</u> Dr. Mitsuaki HAYASHI Apr.25,1989 - Oct.24,1991			———	———	———		
Dr. Yukiko OGURA May 14,1992 - Dec.09,1993						———	———
<u>Bacteriology</u> Dr. Masaharu KANAMEDA Nov.08,1991 - Dec.09,1993						———	———


EXPERTS
1st Year Dec.1986~
2nd Year Dec.1987~
3rd Year Dec.1988~
4th Year Dec.1989~
5th Year Dec.1990~
6th Year Dec.1991~
7th Year Dec.1992~
FMD
Dr. Takaaki SUGIMURA
Mar.30,1987 - Mar.29,1988
Dr. Junsaku SIRAI
Aug.01,1988 - Jul.31,1989
Dr. Shigeo YAMAGUCHI
Oct.03,1989 - Oct.02,1990
Dr. Kenichi SAKAMOTO
Nov.20,1990 - Nov.19,1991
Dr. Koichi NAMBA
Dec.18,1991 - Dec.17,1993
FMD
Dr. Toshihito SUZUKI
Jun.04,1987 - Jun.03,1988
Dr. Akio FUKUSHO
Oct.01,1988 - Dec.25,1989
Dr. Toru INOUE
Feb.20,1990 - Feb.19,1991
Dr. Mariko ETO
Jan.10,1991 - Jan.09,1992
Short-term experts
1986 Japanese Fiscal Year
Bacteriology
Dr. Hiroshi WATASE
Jan.20 - Apr.17,1987
Biochemistry
Dr. Shigeyoshi NAGASAWA
Jan.20 - Mar.31,1987
1987 Japanese Fiscal Year
FMD
Dr. Koichi NAMBA
Apr.16 - Jul.15,1987
Virology
Dr. Chuzo USHIMI
Oct.18 - Oct.31,1987
Bacteriology
Dr. Kazunori HASHIMOTO
Nov.27,1987 - Feb.15,1988
Pathology
Dr. Tomoo YOSHINO
Nov.27,1987 - Feb.26,1988
Biochemistry
Dr. Yoshiko MOTOI
Jan.10 - Mar.09,1988

Annex 3

Number of Thai counterparts studied in Japan

Belong to	1986	'87	'88	'89	'90	'91	'92	'93	Total
DLD									
Director General(observation tour)				1				(1)*	2
Deputy D. G. (observation tour)				1					1
NAHPI									
Director								(1)*	1
Extension & Technology Transfer							1		1
Maintenance					1				1
Bacteriology		1	1	1	1			1	5
Pathology	1	1		1		1	1		5
Biochemistry	1	1		1	1				4
Parasitology		1	1		1	1		1	5
Virology		1		1	1	1		1	5
Epidemiology			1		1	1	1		4
Immuno-serology				1		1	1	1	4
Experimental Animal							1		1
FMD Center		1	1		1	1	1		5
Total	2	6	4	7	7	6	6	6	44

*( ) Expected.

TRAINING IN JAPAN	1st Year Dec.1986～	2nd Year Dec.1987～	3rd Year Dec.1988～	4th Year Dec.1989～	5th Year Dec.1990～	6th Year Dec.1991～	7th Year Dec.1992～
1986 Japanese Fiscal Year							
Biochemistry-1 Dr. Rumpa INTRARAKSA Mar.22 - Jun.21,1987	—						
Pathology/EM-1 Dr. Supote METHIYAPUN Mar.26 - Sep.25,1987	—						
1987 Japanese Fiscal Year							
Bacteriology-1 Dr. Ladda MULIKA May 22 - Nov.21,1987		—					
Biochemistry-2 Ms. Prapit KLAININ Aug.29,1987 - Feb.26,1988		—					
Parasitology-1 Dr. Nopporn SARATAPHAN Jan.10 - Jul.09,1988		—					
Pathology/EM-2 Dr. Ladda TRONGWONGSA Mar.27 - Sep.24,1988		—					
FMD-1 Dr.Cherngchai CHUNTHARUSMI Mar.27 - Sep.24,1988		—					
Virology-1 Dr. Wasana PINYOCHON Mar.27 - Oct.14,1988		—					
1988 Japanese Fiscal Year							
Bacteriology-2 Dr. Indhira KRAMOMTONG May 29 - Dec.03,1988			—				
Epidemiology-1 Dr. Jatuporn SMITANON Aug.08,1988 - Mar.09,1989			—				
FMD-2 Dr. Arinee CHATCHAWANCHON-TEERA Aug.08,1988 - Mar.09,1989			—				
Parasitology-2 Dr. Sukanyanee THONASUTH Feb.13,1989 - Feb.10,1990				—			
1989 Japanese Fiscal Year							
Virology-2 Dr. Arunee CHAISINGHA Aug.28,1989 - Mar.04,1990				—			
Immuno-serology-1 Dr. Monaya EKGATAT Aug.28,1989 - Aug.23,1990				—			

TRAINING IN JAPAN	1st Year Dec.1986~	2nd Year Dec.1987~	3rd Year Dec.1988~	4th Year Dec.1989~	5th Year Dec.1990~	6th Year Dec.1991~	7th Year Dec.1992~
Biochemistry-3 Dr. Anong BINTVIHOK Aug.28,1989 - Apr.04,1990							
Bacteriology-3 Dr. Pornpen PATHANASOPHON Aug.28,1989 - Apr.04,1990							
Pathology-3 Dr. Somboon SUTHERAT Jan.08 - May 07,1990							
Observation Tour Director General Dec.03 - Dec.12,1989							
Deputy Director Dec.03 - Dec.12,1989							
1990 Japanese Fiscal Year							
Machinery Maintenance-1 Mr. Vinai UTHAIVARAVIT Sep.10,1990 - Mar.06,1991							
Parasitology-3 Dr. Piyanoot PRASITIRATANA Sep.24,1990 - Apr.24,1991							
FMD-3 Ms. Thanarat JANUKIT Oct.28,1990 - Jun.05,1991							
Virology-3 Dr. Sujira PARCHARIYANON Oct.28,1990 - Jun.05,1991							
Epidemiology-2 Dr. Chit SIRIVAN Oct.28,1990 - Jun.05,1991							
Bacteriology-4 Dr. Pacharee THONGKAMKOON Oct.28,1990 - Jun.05,1991							
Biochemistry-4 Ms. Malee TEERANUSONTI Oct.28,1990 - Jun.05,1991							
1991 Japanese Fiscal Year							
Parasitology-4 Dr. Tasanee CHOMPOOCHAN Oct.28 - Dec.21,1991							
FMD-4 Dr. Naris WONGVATTANAKUL Oct.09,1991 - Apr.25,1992							
Epidemiology-3 Dr. Chaisiri MAHANTACHAISAKUL Oct.09,1991 - Jun.20,1992							
Pathology-4 Dr. Surapong WONGKASEMCHIT Oct.09,1991 - Sep.12,1992							

TRAINING IN JAPAN	1st Year Dec.1986~	2nd Year Dec.1987~	3rd Year Dec.1988~	4th Year Dec.1989~	5th Year Dec.1990~	6th Year Dec.1991~	7th Year Dec.1992~
Immuno-serology-2 Dr. Bunchong APIWATNAKORN Oct.09,1991 - Sep.12,1992							
Virology-4 Dr. Ruenrudee PUNYAHOTRA Oct.09,1991 - Sep.12,1992							
1992 Japanese Fiscal Year							
Experimental Animal-1 Dr. Tarika PRAMOOLSINSAP Oct.26,1992 - Sep.21,1993							
Extension & Technical Transfer-1 Dr. Sopit TUNYALUKSNKUL Feb.18 - Aug.03,1993							
MD-5 Dr. Pisamai LEAMCHARASUKUL Oct.26,1992 - Jul.27,1993							
Epidemiology-4 Dr. Prateep PEMAYODHIN Oct.26,1992 - Mar.09,1993							
Immuno-serology-3 Dr. Duangjai SUWANCHAROEN Oct.26,1992 - Mar.23,1993							
Pathology-5 Dr.Tuangthong PATCHIMASIRI Oct.26,1992 - Jun.01,1993							
1993 Japanese Fiscal Year							
Observation Tour Director General Director of NAHPI							
Immuno-serology-4 Dr. Dilok GESORNSOMBAT Apr.15 - Jun.12,1993							
Virology-5 Dr. Urasri TANTASWASDI Apr.15 - Jun.12,1993							
Bacteriology-5 Dr. Tipa TANTICHAROENYOS Apr.15 - Jun.12,1993							
Parasitology-5 Dr. Patchima INDRAKAMHANG Apr.15 - Jun.12,1993							

Annex 4 Major equipment provided for the Project

Section Administration

Equipment	NAHPI-Number	Frequency of use/month
1. Telephone HITACHI (PA)	5805-001-0001-001	everyday
2. Station wagon (Nissan) (8 9 4998)	2310-002-0001-001	everyday
3. Station wagon (Nissan) (8 9 4993)	2310-002-0001-002	everyday
4. Mini Bus (Isuzu) (4 B 5654)	2310-003-0001-001	everyday
5. Micro Bus (5 T 4605) Toyota	2310-004-0001-001	everyday
6. Micro Bus (2 M 0249) Toyota		everyday
7. Double cabin truck (4 T 4392) Toyota	2320-008-0001-001	everyday
8. Double cabin Isuzu Isuzu (2 M 8539)	2320-008-0001-003	everyday
9. Double cabin Isuzu (2 M 8540)	2320-002-0001-004	everyday
Isuzu (2 M 8541)	2320-008-0001-005	everyday
10. Truck (2 M 9057) Toyota	2320-008-0001-007	everyday
11. Type writer (Electric) Olympia 100 BI	7430-001-0001-001	everyday
12. Type writer (Electric) Olympia 100 BI	7430-001-0001-002	everyday
13. Type writer (Electric) Master type	7430-001-0001-003	everyday

Equipment	NAHPI-Number	Frequency of use/month
14. Copy Machine Minolta EF 410 Z	7430-003-0001-002	everyday
15. Copy Machine Minolta EF 409 Z	7430-003-0001-003	everyday
16. Roneo Machine	7430-004-0001-001	everyday
17. Personnel Computer	7440-001-0001-003	everyday
18. เครื่องถ่าย Ricoh FT 5050	7430-003-0001-001	everyday

Section Bacteriology

Equipment	NAHPI- Number	Frequency of use/month
Incubator,Hirasawa 0-37°c	6515-028-0001	everyday
Incubator,Hirasawa 0-37°c	6515-028-0002	everyday
Autoclave,Tomy (120°c)	6530-003-0001	10
Incubator,SY-110 (0-50°c)	6515-028-0003	everyday
Centrijuge,Tomy max 20,000 rpm/min	6515-006-0002	everyday
Microscope,+camera Olympus 1 set	6650-012-0001	10
Microscope,Olympus (CH)	6650-007-0002	everyday
Lamina flow (clean bench)	6515-026-0002	everyday
Lamina flow (clean bench)	6515-026-0001	everyday
Lyophilized freeze dryer	6515-100-001-001	20
TE-HER CO_2 gas-incubator	6515-028-0004	everyday
Ultra low freezer (-80°c)	4110-007-0002	everyday
Freezer (-20°c)	4110-007-0001	everyday
Anaerobic incubator	6515-028-0005	everyday
Filting sterilizer	6515-074-0001	20
pH meter	6515-017-0001	everyday
Air pump	6515-025-0001	20
Balance (0.01-2,800 gm)	6670-002-0001	everyday

Section Parasitology

Equipment	NAHP1-Number	Frequency of use/month
1. Microscope, Olympus, Tokyo, SZ-TR-W	6650-007-0001-001-005	22
2. Microphotographic Apparatus-automatic photography (Olympus, PM10-35-AD-1)	6650-012-0001-003	10
3. PH-meter (Twaki glass, M-225)	6515-017-0005-001	everyday
4. Data prosescor Computer set (Tavon, PC-386)	744-001-0001-007	25
5. Refugerated centrifuge+FN, balance (Kokusan H-200NR)	6515-006-0004-004	70
6. Water purifier (Advantec GSU-901+trans)	6515-089-0001-001	10
7. Co_2 Incubator (Sanko CPD-170)	6515-028-0006-004	everyday
8. High speed refrigerated centrifuge micro-2000 rpm (Tomy 150)	6515-006-0004-003	24
9. Hematocrit centrifuge (Tomy HC-12 A)	6515-006-0001-001	60
10. Electronic Balance (Shimadzu, EB-330 H)	6670-002-0002-001	50
11. Automatic blood cell counter (Tokyo ERMA, PC-603A)	6515-005-0001-001	20

Equipment	NAHPI-Number	Frequency of use/month
12. Lamina flow (Hitachi, CCV-1311)	6515-026-0002-003	20
13. Homogenizer (Sanko, PD-18)	[illegible]	10
14. Hot plate-stirrer (Iwaki Glass AC-551)	6515-077-0001-002	30
15. Autoclave (Tomy, SS-320)	6530-003-0001-003	12

Section Pathology

Equipment	NAHP1-Number	Frequency of use/month
1. Transmission electronmicroscopic	6650-007-0003-001	50
2. Scanning electronmicroscopic	6650-007-0003-002	20
3. Automatic processor	6515-044-0001-001	20
4. Tissue-Tex (Miles scientific)	6515-045-0001	20
5. Olympus BH-2 with camera (2 persons)	6650-012-0002-004	15
6. Olympus BH-2 with televesion (parasonic) (5 persons)	007-0016-001	15
7. Refrigerated centrifuge t RS-20 IV	6515-006-0002-003	5
8. Olympus BH-2 (personel use)	-	20
9. Knifemaker II (LKB Bromma)	6515-043-0001-001	30
10. Ultrotomer (LKB)	6515-042-0001-001	20
11. Electron microscope oven (M.TD-75 DOSAKA)	6650-007-0003-003	20

Equipment	NAHPI-Number	Frequency of use/month
12. Cell counter HC 510 (Hycel®)	-	8
13. Hematocrit centrifuge (Hematocrit KH-12005)	6515-006-0004-001	12
14. Computer Epson PC AX2	-	
Printer Epson LX800	-	12
15. Panacopy (KV3500)	6650-012-0006	rare

Section Biochemistry and Toxicology

Equipment	NAHPI-Number	Frequency of use/mont
1. Electronic balance (AEL - 160 -11)	6670-002-0004	50
2. Gas chromatography (GC-9A Shimadry)	6515-048-0001	everyday
3. Microcomputer system 25 PC type S 2526 (Philips)	7440-001-0001	20
4. HPLC (655A-11) Hitachi	6515-069-0001	everyday
5. Rotary evaporator (RE-46) Yamato	6515-061-0001 6515-061-0002	everyday
6. Atomic absorption spectrophotometer (AA-640-12) Shimadzu	6515-055-0001	everyday
7. Digital calorimeter (KSD-10)	6515-058-0001	5
8. Spetrophotometer (UV-120-02)	6515-056-0001	10
9. Fluorescence spectrophotometer (650-105) Hitachi	6515-057-0001	everyday
10. Spectrophotometer (DU-64) Beckman)	6515-057-0001-004	everyday

Equipment	NAHPI-Number	Frequency of use/mont
11. Medical freezer (MDF-330) Sanyo	4110-007-0003-002	everyday
12. Incubator (Binder type B-240)	6515-028-0001-008	everyday
13. Ultrasonic cleaner (T-700H) Elma	6530-009-0001-002	everyday
14. Water distiller	6515-006-0006-002	everyday
15. Auto still (Model WA-52) Yamato	6515-034-0002	everyday
16. Data processor Chromatopoc (C-R4A, Shimadzu)	7440-013-0001-001 7440-013-0001-002	everyday

Section Immuno-serology

Equipment	NAHPI-Number	Frequency of use/month
Incubator (Ambient)		everyday
ELISA reader+computer		15
Sonicator		3
Autoclave, 50 litr		everyday
Refrigerator, 25 cub.		everyday
Deep freezer (-40°C)		everyday
Ultra freezer		everyday

Section Epidemiology

Equipment	NAHFI-Number	Frequency of use/month
1. Microcomputer (Philips)	7440-001-0001-002	6 hrs everyday except holiday
2. Microcomputer (ACER)	7440-001-0001-005	
3. Microcomputer (Thavon)	7440-001-0001-006	
4. Microcomputer (Toshiba)	7440-001-0001-008	
5. U.P.S Model PG-500i	7440-012-0001-001	
6. Printer Epson Model LQ 105(	7440-011-0001-001	
7. EP, Laser Printer	7440-002-0001-001	22 tines/month
8. CAMERA (Nikon Model FM 2)	6720-005-0001-002	1-2 tine/month
9. Freezer(Sanyo Model MDE435)	4110-007-0005-001	all tine
10. Refrigerator (Hoshizaki Model HRF-120 KT)	4110-001-0001-017	all tine
11. Air condition (Saijo Denri	4120-001-0001-092	6 hrs official day
12. Hematocrit Centrifuge (Hetidge Model 2010)	6515-006-0007-002	8 tines/month
13. Centrifuge (tomy seiko)	6515-006-0001-006	
14. Centrifuge kokusan Model H 18	6515-006-0001-004	
15. Centrifuge kokusan Model H 18	6515-006-0001-005	
16. Microscope (Olympus CH-2)	6650-007-0001-014	3 hrs. everyday except holiday

Section Extension and Technology Transfer

Equipment	NAHPI-Number	Frequency of use/mont
- Kodak ektagraphic audio viewer 575 AF with slide tray 80 P.C. remote control and audio projector 1 set		10
- Copy machine (sharp)		20
- Computer Macintosh II si Model number M0 401 with scan maker Microtek 600 ZS and Macintosh laserwriter II		everyday
- Vedeo cassette recoder National NV 8500		5
- Vedeo camera National F10 CCD Model type F10 M		5

Section Washing-Sterilization

Equipment	NAHPI-Number	Frequency of use/month
1. Oven 2 timer chamber Model UN-330 Memmert	6530-034-0001-001	44
2. Autoclave type ZK-1-S304 TE-HER product T-502	6530-003-0001-005	8
3. Steam Sterilizek type ZAV -5E Hirasawa	6530-029-0001-001	44
4. Steam Sterilizer type ZAV -5E Hirasawa	6530-029-0001-002	44
5. Dry Heat Sterilizer Model GM-120, sanko	6530-008-0001-001	4
6. Dry Heat Sterilizer Model GM-120, sanko	6530-008-0001-002	4
7. Ultrasonic cleaner Model AT-1824-36 Branson-Module	6530-009-0001-001	66
8. E.O. gas sterilizer Model E.O.-200 S	6530-010-0001-001	20
9. Washing machine Model BS-2530, asahi	6530-011-0001-001	5
10. Dehydrator Model AF-20asahi	6530-012-0001-001	5
11. Laundry dryer Model NLii-20-SW, asahi	6530-013-0001-001	5
12. Press Model NAP-100, asahi	6530-014-0001-001	5
13. Automatic Washer Model AW-82	6530-016-0001-001	20

Equipment	NAHPI-Number	Frequency of use/month
14. Dryine shelf Model SPH 111	6530-019-0001-001	44
15. Dryine shelf Model SPH 111	6530-019-0001-002	44
16. Dryine shelf Model SPH 111	6530-019-0001-003	44

Section Experimental Animal Unit

Equipment	NAHPI-Number	Frequency of use/mont
1. Cooling tower	—	everyday
2. Rabbit cage rack	6530-021-0001-3	everyday
3. Guinea pig cage rack	6530-022-0001	everyday
4. Dehumidifier	6530-027-0001	everyday
5. Supply fan	4140-005-0001-028	everyday
6. Exhaust fan	4140-006-0001-031	everyday
7. Air condition	4120-001-0080	everyday
8. Chicken cage rack	6530-028-0001	everyday
9. Steam cleaner	6530-029-0001	everyday
10. Incinerator (large)	4430-003-0001	everyday
11. Ken Hoist	3940-005-0001(1)	everyday
12. Incinerator (small)	4430-003-0002	everyday

Section Virology

Equipment	Number	Frequency of use/month
1. Ultracentrifuge Model SCP-55H, Hitachi	6515-006-0009	10
2. Density gradient fractionator Model DGF-U, Hitachi	6515-031-0001	5
3. Centrifuge 1 Model RS-20-IV, Tomy	6515-006-0004	almost every day
4. Centrifuge 2 Model J-6B	6515-006-0008-001	almost every day
5. Lamina flow (Lean bench)-1- Model CCV-1311, Hitachi	6515-026-0004	almost every day
6. Lamina flow (Lean bench)-2- Model PCV-1303, Hitachi	6530-009-0002-007	almost every day
7. Freezer -70°C -1- Model MDF-381 AT, Sanyo	4110-007-0004	every day
8. Freezer -70°C -2- Model 8425 S/N 83433-1038, Forma Scientic Inc.	4110-007-0006-001	every day
9. Freezer -20°C -1- Model U-190, Kelvinator	4110-007-0003	every day
10. Freezer -30°c -1- Sanyo medical freezer	4110-007-0004-001	every day
11. Freezer -30°c -2- Sanyo medical freezer		every day
12. Water still Model WA-52, Yamato	6515-034-0001	almost every day
13. Projector TM Laboratory Hood LABCONCO®	6515-047-0002-001	almost every day

Equipment	Number	Frequency of use/month
14. Inverted microscope Nikon UFX	6650-007-0003	almost every day
15. FA microscope Nikon UFX-II	6650-007-0004	almost every day
16. CO_2 Incubator -1- Model WJ-12D, HIRASAWA	6515-028-0010	every day
17. CO_2 Incubator -2- Model IT 262, Yamato	6515-028-0006-005	every day
18. Incubator -1- Model HD-12 B, HIRASAWA	6515-028-0006	every day
19. Incubator -2- Model HD-10-C, HIRASAWA	6515-028-0007	every day
20. Incubator -3- Model P-1, Showa Furianki	9515-028-0008	every day
21. Low temperature incubator Model SY110, Sanko Irika	6515-028-0009	every day
22. Cool chamber Model 2021 Maxicoldlab LKB® BROMMA	6515-092-0001-001	4
23. Microplate washer Model 120, Flow	6515-035-0001	20
24. Multiscan microplate Photometry apparatus Model MCC,Flow	6515-035-0002	20
25. Transilluminator Model TC-312 A/F SPECTROLINE®	6515-091-0001-001	20
26. Polaroid MP-4 Multipurpose Carmera and Accessory	6720-005-0002-001	20

Equipment	Number	Frequency of use/month
27. Microwave multiwave,Litton® Model 2485 S/N 008101	6515-093-0002-001	almost every day
28. Roller culture with accessories Forma® Model 4868 S/N 34022-212	6515-037-0002-001	almost every day
29. Shaker bath "BELLY DANCER /HYBRIDIZATION WATER BATH" Model BDHWB 220 Stovall®		almost every day
30. EL. Analytical balance Mattler Model AE 240 S/N 008101	6670-002-001-012	almost every day
31. Soniv vibrator Model VR -200P, Tomy	6515-022-0002	almost every day
32. Ultrasonic disruptor Model UR-200P, Tomy	6515-002-0002	almost every day
33. Autoclave Model HA-300P, HIRASAWA		almost every day

Annex 5

Equipment, materials and others provided by JICA budget
(Million yen ; 1986 -1993)

Fiscal year	Equipment & materials		Special programs#	Local expense@	Total
	Procured	Carried by experts			
1986	65.5	5.7		2.2	73.4
1987	47.0	18.1	0.5	8.9	74.5
1988	69.3	5.9	2.0	7.4	84.6
1989	70.8	4.2	2.0	6.8	83.8
1990	88.7	2.6	3.3	6.8	101.4
1991	37.2	2.8	4.8	6.8	51.6
1992	30.0	1.8	8.1	6.8	46.5
1993**	24.0	1.2	11.6	7.7	44.5
Total	432.5	42.3	32.3	53.4	56o.3

** Budget is allocated and implementation is going on.

Special program: Modification and repair of building, seminar,training course and publication for extension.
1992: Small animal unit facilities in FMD Center were modified. Training course for Provincial Livestock Officer and publication of Annual Report.
1993: Seminar, training course "Swine Diseases", Annual Report.

@ Local expense : Expenses for activities of experts and Thai counterparts such as laboratory materials, small equipment, and so on.

Annex 6 The present staff for NAPHI

	NAME	POSITION	P.C.LEVEL
1.	Mr. VICHITR SUKHAPESNA	Director of NAHPI	8
	Administration Section		
1.	Mr. VIMOL JIRATHANAWAT	Chief of Administration	7
2.	Ms. PRATIN YAMSUNTRON	General Affair Officer	5
3.	Ms. SUNEE PRADUPMOOK	General Affair Officer	4
4.	Miss VILAIWAN PRAYOAD	General Affair Officer	3
5.	Mr. PATIPORN TAPANAGULSAK	Veterinary Officer	4
6.	Mr. VINAI UTHAIVARAVIT	Scientist Officer	5
7.	Mr. SAMART SRIJUN	Mechanical Officer	3
8.	Mr. AMORN PONGSAI	Mechanical Officer	3
	Epidemiology Section		
1.	Mr. PRATEEP PEMAYODHIN	Chief of Epidemiology	8
2.	Mr. JATUPORN SMITANON	Veterinary Officer	7
3.	Mr. YODYOT MEEPHUCH	Veterinary Officer	7
4.	Mr. CHIT SIRIVAN	Veterinary Officer	7
5.	Mr. SUKAPONG WONGKASEMCHIT	Veterinary Officer	6
6.	Mr. CHAISIRI MAHANTACHAISAKUL	Veterinary Officer	5
7.	Miss KANYA ARSAYUTTI	Veterinary Officer	4
8.	Mr. PORNPIRUN POOLSRI	Paraveterinary Officer	5
9.	Mr. UTHIT TRINANTAWAN	Paraveterinary Officer	5
10.	Mr. SARAYUTTH KAEWKALONG	Paraveterinary Officer	2
	Immuno-Serology Section		
1.	Mr. DILOK GASORNSOMBAT	Chief of Immuno-Serology	8
2.	Mr. BUNCHONG APIWATNAKORN	Veterinary Officer	7

	NAME	POSITION	P.C.LEVEL
3.	MS. SUKEE THAMMASART	Veterinary Officer	7
4.	Miss MONAYA EKUATAT	Veterinary Officer	7
5.	Ms. DUANGJAI SUWANCHAROEN	Veterinary Officer	5
6.	M.L. NAKUDEE KASHEMSANT	Veterinary Officer	4
7.	Mr. SOMCHAI CHARNGTHONG	Paraveterinary Officer	5

Pathology Section

1.	MS. SOMBOON SUTHERAT	Chief of Pathology	8
2.	Ms. CHIRA KONGKRONG	Veterinary Officer	7
3.	Ms. BUSANEE CHANPRASERT	Veterinary Officer	7
4.	Ms. LADDA TRONGWONGSA	Veterinary Officer	7
5.	Ms. TUONGTONG PATCHIMASIRI	Veterinary Officer	6
6.	Miss SUNTANA LOKAPUNPAIBUL	Veterinary Officer	4
7.	Mr. PAIROJ PONGKIDAKARN	Veterinary Officer	6
8.	MS. KAENU POTHIPUN	Scientist	4
9.	Miss SOMCHIT RUCHIKUAN	Scientist	2

Parasitology Section

1.	Ms. TASANEE CHOMPOOCHAN	Chief of Parasitology	8
2.	MS. PATCHIMA INDRAKAMHANG	Veterinary Officer	7
3.	Cap. PIYANOOT PRASITIRATANA	Veterinary Officer	7
4.	Miss DARUNEE TUNTASUVAN	Veterinary Officer	6
5.	Ms. MONTAKAN WONGPAKORN	Veterinary Officer	4
6.	Miss SUPAWAN SAHNGAEMLAK	Paraveterinary Officer	4
7.	Miss TIPPAWAN PUNMAMUANG	Paraveterinary Officer	4
8.	MS. KINGDAO MOKAEW	Paraveterinary Officer	3

NAME	POSITION	P.C.LEVEL
Toxicology and Biochemistry Section		
1. Ms. KUMPHA INTRAKAKSA	Chief of Toxicology and Biochemistry	8
2. Ms. ANONG BINTVIHOK	Veterinary Officer	7
3. Ms. PANUN TANACHAROENWATCH	Veterinary Officer	6
4. Miss LANEE SOOKTHINTHAI	Veterinary Officer	6
5. Ms. SUCHIN UTTASART	Scientist	7
6. Ms. PRAPIT KLAININ	Scientist	6
7. Ms. NITTAYA PHOENGPONG	Scientist	6
8. Ms. TASANEE THITAKAMOL	Scientist	5
9. Ms. MALEE TEERANUSONTI	Scientist	5
10. Miss ACHARA RATANAPHAN	Scientist	3
11. Mr. SURAPONG WONGSUTTHAWART	Paraveterinary Officer	4
12. Mr. JESADA KUNKHRAU	Paraveterinary Officer	2
Bacteriology Section		
1. Ms. TIPA TANTICHAROENYOS	Chief of Bacteriology	8
2. Ms. KAEWMANEE KONGSMAK	Veterinary Officer	8
3. Ms. WALLAPA NUNBHAKDI	Veterinary Officer	7
4. Miss LADDA MULIKA	Veterinary Officer	7
5. Ms. WANTANEE NERAMITMANSOOK	Veterinary Officer	7
6. Ms. INDHIRA KRAMOMTONG	Veterinary Officer	7
7. Ms. PORNPEN PATHANASOPHON	Veterinary Officer	7
8. Ms. PACHAREE THONGKAMKOON	Veterinary Officer	5
9. Mr. SUVIT LIMAWONGPRANEE	Veterinary Officer	5
10. Ms. WONGANUN NARONGWANICHGARN	Veterinary Officer	4

	NAME	POSITION	P.C.LEVEL
11.	Ms. KACHANEE SINPRASOPCHAI	Paraveterinary Officer	4
12.	Ms. UBULRAT TANKLANG	Paraveterinary Officer	4
13.	Mr. NOPPORN TOHMEE	Paraveterinary Officer	3
14.	Mr. KIATISAK RATANASOMBAT	Paraveterinary Officer	3
15.	Miss AINGON SATHUWONG	Scientist	3

Virology Section

1.	Ms. URASRI TANTASWASDI	Chief of Virology	8
2.	Ms. AREE SUPCHAROEN	Veterinary Officer	7
3.	Ms. WASANA PINYOCHON	Veterinary Officer	7
4.	Ms. PORNTIP SIRIVAN	Veterinary Officer	7
5.	Ms. SUJIRA PARCHARIYANON	Veterinary Officer	7
6.	Ms. ARUNEE CHAISINGHA	Veterinary Officer	7
7.	Miss RUENRUDEE PUNYAHOTRA	Veterinary Officer	6
8.	Mr. PORNCHAI ESRAKAPONGPAISAL	Veterinary Officer	4
9.	Mr. CHAIWAT SAWAENGDEE	Paraveterinary Officer	5
10.	Mr. ANUSAK SIRICHAN	Paraveterinary Officer	4
11.	Mr. SURASAK CHUENJAI	Paraveterinary Officer	4

Experimental Animal Section

1.	Miss TARIKA PRAMOOLSINSAP	Chief of Experimental Animal	
2.	Mr. PINIT TANRAT	Paraveterinary Officer	6
3.	Mr. SOMCHAI BORISUTISUWAN	Paraveterinary Officer	5

Technology Transfer Section and Library Service

1.	Miss SOPIT TUNYALUKSUKUL	Chief of Technology Transfer Section and Library Service	7

NAME	POSITION
National Livestock Information Center	
1. Mr. ONGART IN-NGAM	Scientist 3
2. Mr. SOMTHAWIL WICHIT	Statist 3
3. Miss PACHARAPORN PHOUPARD	Statist 3
4. Miss SUPANYU MANALAWET	Data Entry Officer 2
5. Miss SUNISA DIDSAKAPRAKAY	Data Entry Officer 1

Permanent Worker

NAME	POSITION
Administration Section	
1. Mr. MUKDA THONGNIKORT	Carpenter
2. Mr. TWATCHAI SOMSAUY	Cleaner
3. Mr. CHAON KONGNARG	Driver
4. Mr. SOMCHART AKUNPULTRVB	Driver
5. Mr. CHALEE PHUHIKUN	Driver
6. Mr. BOONCHOB BOONPRAPA	Mechanie
7. Ms. BOOBPHA JUNGSAWAD	General Affair
8. Ms. KATANA SATPRASITHI	Typist
9. Miss PHAYAW TABTANG	General Affair
10. Ms. NUANPRANG MARAXART	General Affair
11. Ms. AREE JUNTOPART	General Affair
12. Ms. NALINEE TIMPRATUM	Washing and cleaner
13. Ms. PORNTIP DORGYAM	Washing and cleaner
14. Ms. ORASA JABBANG	General Affair
15. Ms. JARIN PIUMCHANG	Reception
16. Ms. SUNEE SOMSAUY	Washing and cleaing
17. Mr. CHOB KHAMTRI	Mechanics
18. Ms. SUREEPORN KERDKOSUM	Reception
19. Mr. REAM KONGTONG	Gardener
20. Mr. CHANA MEESLAE	Gardener
21. Mr. SOMPORN PUMMANEENIL	Mechanics
22. Mr. PRAYONG SALUNGOUL	Gardener
23. Mr. BUNLEU KATVISAD	Gardener

NAME	POSITION
Epidemiology Section	
1. Mr. KUAN KHUNKHONG	Washing and cleaner
Immuno-Serology Section	
1. Ms. MANUS PEUKPANMOOK	Washing and cleaner
Pathology Section	
1. Mr. SUVIT SILA	Post Mortem Worker
Parasitology section	
1. Miss NITAYA PANMAKASKI	Washing cleaning
Toxicology and Biochemistry Section	
1. Ms. CHOMYONG THEEKADAKORN	Washing and cleaning
2. Mr. KASEM JAKUWAN	Washing and cleaning
Bacteriology Section	
1. Mr. KOMOL CHAROENNUCH	Washing and cleaning
2. Ms. SOMPORN SESAMA	Washing and cleaning
Virology section	
1. Mr. ANAN PADUNGKHAN	Washing and cleaning
2. Ms. JINTANA KRASAECHAI	Washing and cleaning
3. Ms. PUNTIP NUNTANAPKONCHAI	Washing and cleaning
4. Mr. TONGDEE CHANTHIP	Washing and cleaning
Experimental Animal Section	
1. Miss BUNGON CHAMNANKUL	Cleaning

NAME	POSITION	P.C.LEVEL
National Livestock Information Center		
1. Mr. NOPPORN SARATAPHAN	Chief of NLIC Committee	
	Veterinarian Officer	6
	Parasitology Section	

Temporary Worker

NAME	POSITION
Administration Section	
1. Miss SUPHANWADEE CHANPEN	General Affair
2. Ms. CHINTANA BUKSRI	Accountant
3. Miss SAMRAN MIAKUN	Accountant
4. Miss THANIKARN MANMUAN	Foreign Relation
5. Miss SAOWANEE KORACH	Foreign Relation
6. Miss TASSNEE SATHIT	Typist
7. Miss ORAWAN TANCHAROEN	Typist
8. Ms. MALA KHIEWKHAE	Typist
9. Miss SURIYA THONGMOON	Typist
10. Miss ATIYA SAMRIT	General Affair
11. Ms. PRAJOUBJIT PHENGKAENTHAO	General Affair
12. Miss SUMITRA PIPITKUL	General Affair
13. Ms. NITAYA BURANAVIT	Cleaner
14. Ms. ORASRI KABKAOSA	Cleaner
15. Miss BUNTA PUMIPONG	Gardener
16. Ms. LAMPAY JAISANG	Gardener
17. Mr. SAMNAENG KEBKAOSA	Gardener
18. Mr. CHAT BOONKONG	Guards
Epidemiology Section	
1. Mr. PRACHA KHONG-Q	Paraveterinary
2. Mr. ANUSORN PHRINTHARAKUN	Paraveterinary

NAME	POSITION
Immuno-Serology Section	
1. Mr. VITAYA BOONNUM	Scientist
2. Mr. PREECHA MEEKACH	Scientist
3. Miss WANNA SOMNAIJAI	Scientist
4. Miss AREE KAMPOL	Cleaner and washing
Pathology Section	
1. Mr. KAKKAIN WATANAPALACHAIGOON	Paraveterinary
2. Miss JERAKAT SUKCHAUY	Scientist
3. Mr. ARKOM THONGJINDA	Scientist
4. Mr. TANOM TAVILSOMNUK	Scientist
5. Mr. ARNOUY JAISEANG	Postmortem Worker
6. Ms. GUNYA SANGKAJANK	Cleaner
Parasitology Section	
1. Mr. SOMBAT KOOPAN	Paraveterinary
2. Miss PIN THAMATHORN	Scientist
3. Miss PRAPRI PONGRAT	Scientist
4. Mr. TAENG SANTO	Cleaner and Washing
5. Ms. SAIPHIN PHOHIKUN	Cleaner and Washing
Toxicology and Biochemistry Section	
1. Mr. SILPACHAI PORMLUD	Paraveterinary
2. Miss KUJIKA BINTVIHOK	Animal Husbandry
3. Miss WASANA BOONLOUK	Scientist
4. Miss KUNGNAPA KIDKUM	Scientist
5. Ms. SUNEE CHOMCHAN	Cleaner and Washing

NAME	POSITION
Bacteriology Section	
1. Mr. SUKAPONG KONGNAK	Paraveterinary
2. Miss SUREE PLAENDACHA	Scientist
3. Miss MUTTHAPHAN PRANPRAKHON	Scientist
4. Mr. THAMTHORN WANSILPIN	Cleaner and Washing
Virology Section	
1. Mr. PHAIKOT MASEANG	Paraveterinary
2. Miss MALIWAL UAMPAN	Scientist
3. Miss LAKANA BUTINPROM	Scientist
4. Miss TIPTIYA YUDTHIYAI	Scientist
Experimental Animal Section	
1. Mr. SOONTORN LAWPREECHAKUL	Paraveterinary
2. Mr. SIRA PHUKSAWANG	Animal Husbandry
3. Mr. NARONG WANGSAIKLANG	Cleaner
4. Ms. KLIEN NGACHAN	Cleaner
5. Miss SUDJAI NAKALO	Cleaner
6. Ms. PUAMSOOK KUNTONG	Cleaner
Technology Transfer Section and Library Service	
1. Mr. NOPPADON ARIYANUVAT	Audiovisual Aid
2. Mr. CHUMPOL KHUNKONG	Audiovisual Aid
3. Miss NITAYA INTAPRADIT	Librarian
4. Miss SUPAPORN PANTASAN	Librarian
5. Miss PATCHARANIPAR PIPITHKUL	Statistic
6. Miss NIKAMOL YOUPUM	General Affair

Annex 7 Allocation of local budget

Budget for Division of Veterinary Research and National Animal Health and Production Institute (Fiscal Year 1992,1993)

Details of Expenditures	1992			1993		
	D.V.R	NAHPI	Total	D.V.R	NAHPI	Total
	12,057,500	11,921,000	23,978,500	16,327,900	14,461,000	30,788,900
1. Salary and permanent employee payment	10,958,700	-	10,958,700	15,287,100		15,287,100
1.1 Salary	9,012,000	-	9,012,000	12,611,440		12,611,440
1.2 Permanent employee payment	1,946,700	-	1,946,700	2,675,660		2,675,660
2. Temporary employee payment	-	3,441,600	3,441,600	-	4,634,300	4,634,300
3. Remuneration, expenses and of materials	1,040,800	4,433,800	5,474,600	1,040,800	5,106,000	6,146,800
3.1 Remuneration	253,600	54,000	307,600	253,600	54,000	307,600
3.2 Expenses	337,900	1,859,000	2,196,900	337,900	2,218,000	2,555,900
3.3 Materials	449,300	2,520,800	2,970,100	449,300	2,834,000	3,283,300
4. Utilities	—	2,600,000	2,600,000	—	3,700,000	3,700,000
5. Equipment, land and construction	58,000	1,445,600	1,503,600	—	1,020,700	1,020,700

Budget for Division of Veterinary Research and National Animal Health and Production Institute (Fiscal Year 1990,199/)

Details of Expenditures	1990			1991		
	D.V.R	NAHPI	Total	D.V.R	NAHPI	Total
	10,187,000	8,115,000	18,302,000	12,217,600	9,682,500	21,900,100
1. Salary and permanent employee payment	8,486,800	-	8,486,800	9,364,400	-	9,364,400
1.1 Salary	6,835,400	-	6,835,400	7,549,700	-	7,549,700
1.2 Permanent employee payment	1,651,400	-	1,651,400	1,814,700	-	1,814,700
2. Temporary employee payment	-	3,040,200	3,040,200	-	3,058,200	3,058,200
3. Remuneration, expenses and of materials	978,200	2,974,300	3,952,500	1,164,200	3,922,100	5,086,300
3.1 Remuneration	180,300	36,000	216,300	187,600	54,000	241,600
3.2 Expenses	316,100	940,800	1,256,900	386,000	1,440,800	1,824,800
3.3 Materials	481,800	1,997,500	2,479,300	590,600	2,427,300	3,017,900
4. Utilities	-	1,895,700	1,895,700	-	2,063,700	2,063,700
5. Equipment, land and construction	722,000	204,800	926,800	1,689,000	638,500	2,327,500

Budget for Division of Veterinary Research and National Animal Health and Production Institute (Fiscal Year 1988, 1989)

Details of Expenditures	1988			1989		
	D.V.R	NAHPI	Total	D.V.R	NAHPI	Total
	7,894,400	5,858,500	13,752,900	7,842,900	6,391,700	14,234,600
1. Salary and permanent employee payment	6,651,500	-	6,651,500	7,040,000	-	7,040,000
1.1 Salary	5,338,400	-	5,338,400	5,681,000	-	5,681,000
1.2 Permanent employee payment	1,313,100	-	1,313,100	1,359,000	-	1,359,000
2. Temporary employee payment	-	2,267,100	2,267,100	-	2,263,700	2,263,700
3. Remuneration, expenses and of materials	1,242,900	1,928,400	3,171,300	802,900	2,472,400	3,275,300
3.1 Remuneration	140,000	36,000	176,000	180,000	36,000	216,000
3.2 Expenses	170,800	447,400	618,200	291,100	647,400	938,500
3.3 Materials	932,100	1,445,000	2,377,100	331,800	1,789,000	2,120,800
4. Utilities	-	1,500,000	1,500,000	-	1,500,000	1,500,000
5. Equipment, land and construction	-	183,000	163,000	-	155,600	155,600

Budget for Division of Veterinary Research and National Animal Health and Production Institute (Fiscal Year 1986, 1987)

Details of Expenditures	1986			1987		
	D.V.R	NAHPI	Total	D.V.R	NAHPI	Total
	8,703,300	7,107,800	15,811,100	8,354,000	5,036,100	31,390,100
1. Salary and permanent employee payment	6,087,600	-	6,087,600	6,921,600	-	6,921,600
1.1 Salary	4,746,700	-	4,746,700	5,553,900	-	5,553,900
1.2 Permanent employee payment	1,340,900	-	1,340,900	1,367,700	-	1,367,700
2. Temporary employee payment	-	-	-	-	1,037,800	1,037,800
3. Remuneration, expenses and of materials	1,798,200	1,798,200	1,798,200	1,202,200	2,313,300	3,515,500
3.1 Remuneration	91,400	91,400	91,400	140,000	36,000	176,000
3.2 Expenses	599,700	597,700	599,700	169,200	934,000	1,103,200
3.3 Materials	1,107,100	1,107,100	1,107,100	893,000	1,343,300	2,236,300
4. Utilities	128,400	128,400	128,400	108,400	1,500,000	1,608,400
5. Equipment, land and construction	689,100	7,107,800	689,100	121,800	185,000	306,800

Budget for Division of Veterinary Research and National Animal Health and Production Institute

Details of Expenditures	1986	NAHPI BUDGET						
		1987	1988	1989	1990	1991	1992	1993
	15,811,100	13,390,100	13,752,900	14,234,600	18,302,000	21,900,100	23,978,500	30,287,100
1. Salary and permanent employee payment	6,087,600	6,921,600	6,651,500	7,040,000	8,480,800	9,364,400	10,958,700	15,287,100
1.1 Salary	4,746,700	5,553,900	5,338,400	5,681,000	6,835,400	7,549,700	9,012,000	12,611,440
1.2 Permanent employee payment	1,340,900	1,367,700	1,313,100	1,359,000	1,651,400	1,814,700	1,946,700	2,675,660
2. Temporary employee payment	-	1,037,800	2,267,100	2,263,000	3,040,200	3,058,200	3,441,600	4,634,300
3. Remuneration, expenses and of materials	1,798,200	3,515,500	3,171,300	3,275,300	3,952,500	5,086,300	5,474,600	6,146,800
3.1 Remuneration	91,400	176,000	176,000	216,000	216,300	241,600	307,600	307,600
3.2 Expenses	599,700	1,103,200	618,200	938,300	1,256,900	1,826,800	2,196,900	2,555,900
3.3 Materials	1,107,100	2,236,300	2,377,100	2,120,800	2,479,300	3,017,900	2,970,100	3,283,300
4. Utilities	128,400	1,608,400	1,500,000	1,500,000	1,895,700	2,063,700	2,600,000	3,700,000
5. Equipment, land and construction	689,100	306,800	163,000	155,600	926,800	2,327,500	1,503,600	1,020,700

Annex 8 List of Publication and Presentation

(October 1990-1993)

Pathology Section

1. Chanprasert, B.,Chaichanapoonpol,I.,Wongkasemchit, S.1993 : Adenovirus infection in calf. Abstracts of the 31st Kasetsart University Annual Conference. February 3-6.

2. Chanprasert, B. 1991 : Comparative Pathologic Studies on Pig Lesions in Natural Infected and Inoculated with Swine Fever Virulent Strain. J. Vet. Biologics. 2(1) : 14-19.

3. Konkrong, C.,Lokapunpibul, S. Wongkasemchit,S. and Sirivan,C. 1993 : Acute Swine Erysipelas. Abstracts of The 31st Kasetsart University Annual Conference. February 3-6.

4. Lokapunpibul, S., Trongwongsa, L. and Shoya, S. 1993 : Myelocytomatosis in Layers. Abstracts of The 31st Kasetsart University Annual Conference. February 3-6.

5. Vayuchote, C, Tanticharoenyos, T., Meephuch, Y. and Sirivan,C. 1991: Paratuberculosis in dairy cattle : 2. Pathological Observation of Paratuberculosis. J. Thai Vet. Med. Assoc. 42(1) : 15-19.

6. Wongkasemchit, S., Ekgatat, M. Tanticharoenyos, T. and Pemayodhin, P. 1993 : Development of immunoperoxidase method for identification of *Mycobacterium paratuberculosis* in bovine tissue. Proceedings of The 12th Annual Livestock Conference. Department of Livestock Development Prachuapkhirikhan. July 21-24.

Virology Section

1. Bunyahotara, R; Supcharoen, A; Tantasawasdi, U. and Mizuno,Y. 1991 Preparation of bovine leucosis antigen for the agar gel immunodiffusion test. J. Thai Vet. Med. Assoc. 42(4) : 219-222.

2. Chaisingha, A. and Tantaswasdi, U. 1991.: Developing virological technique for diagnosis of Marek's disease. Proceedings of the 10th Annual Livestock conference. 13-16 September 1991. Pattaya.

3. Chaisingha, A., Tantaswasdi, U. and Sirivan, P. 1992. Preparation of fluorescent antibody conjugate for rapid diagnosis of infectious laryngotracheitis. Proceedings of the 11th Annual Livestock conference. 16-19 September, Chiengmai.

4. Parchariyanon, S ; Methiyapun, P., Pinyochon, W. and Tantaswasdi, U. 1990. A micro END method for the detection of antibody to swine fever verus. J. Thai Vet. Med. Assoc. 41(4): 149-156.

5. Parchariyanon , S.; Pinyochon, W.; Methiyapun, P.; Tantaswasdi, U. and Rujtikumporn, B. 1990. The protective effect of swine fever vaccines against challenge with a field isolate. Proceeding of the 7th Federation of Asian Veterinary Associations. 4-7 November, Pattya.

6. Parchariyanon, S. , Pinyochon, W. ; Tantaswasdi, U. and U. and Morimoto, T. 1992. Preparation of fluorescent antibody conjugate for diagnosis of Japanese encephalitis in pigs. J. Thai Vet. Med. Assoc. 43(1) : 21-30.

7. Pinyochon, W.; Parchariyanon, S. and Tantasawasdi, U. 1991. A study on an enzyme linked immunosorbent assay for the detection of antibody to swine fever virus. Proceedings of the 10th Annual Livestock Conferrence 13-16 September 1991. Pattaya.

8. Sirivan, P., Pramoolsinsap, T., Tantaswasdi, U. and Chaisingha, A. 1992. Easly response and protection of Newcastle disease vaccine LaSota strain. Proceedings of the 11th Annual Livestock conference. 16-19 September Chiengmai.

9. Supcharoen, A. 1990. Infectious bovine rhinotracheitis in Thailand.: II. Isolation and identification of the isolated virus. Proceedings of the 7th Congress of Federation of Asian Veterinary Associations. 169-174.

10. Supcharoen, A; Bunyahotara, R and Morimoto, T. 1992. Studies on bovine ephemeral fever.: I. Isolation of BEF virus in experimental animal and cell culture. Thai J. Vet. Med. (inpress).

11. Supcharoen, A; Pemayodhin, P; Bunyahotara, R; Tantasawasdi,U and Morimoto, T. 1992. Preliminary survey of antibodies of arthropod-borne viruses in cattle in the central part of Thailand. J. Vet. Biologics. 3(1) : 4-10.

12. Tantaswasdi, U., Danvivatanaporn, J., Mahantachisakul, C., Sirivan, P., Chaisingha, A. and Pramoolsinsap, T. 1991. Control of Newcastle disease in village chickens with oral HRV_4 vaccine in Thailand. International workshop on the control of Newcastle disease in village chickens with thermostable oral vaccine. 7-10 October 1991. Kuala Lumpur, Malaysia.

Bacteriology Section

1. Kramomthong, I., Neramitmansook, W. Whip, S.C., Joens, L.A, Limawongpranee, S. 1991 : Development of the Enzyme--Linked Immunosorbent Assay (ELISA) of Herds Affected with Swine Dysentery. Proceedings of The 10th Annual Livestock Conference. Department of Livestock Development. September 13-16.

2. Kramomthong I., Neramitmansook, W. Tanticharoenyos, T. and Kortheerakul, K. 1991 : Serotypes isolated of *Treponema hyodysenteriae* from swine herds affected with swine dysentery in the central region. Proceedings of The 10th Annual Livestock Conference. Department of Livestock Development. September 13-16.

3. Kramomthong, I., Neramitmansook, W. Smitanon, J. 1991 : Prevalence of swine dysentery in the central area. Proceedings of The 18th Annual Veterinary Sciences Conference. November 4-6.

4. Kramomthong, I., Pramoolsinsap, T. Kongkrong, C. and Tungsuwan, M. 1993 : Study of Streptococcosis in pigs. Proceedings of The 12th Annual Livestock Conference. Department of Livestock Development Prachuapkhirikhan. July 21-24.

5. Neramitmansook, P., Rungvetvuthivitaya, V. Neramitmansook,W., Morgan, D.O. and Carter, G,R., 1990 : Development of a serologic test to measure immunity in cattle and buffaloes to *Haemorrhagic Septicemia* Proceedings of The 7th FAVA congress. Pattaya Chonburi Province. November 4-8.

6. Pathanasophon, P., Trongwongsa, L. Morozumi, T. and Tanticharoenyos, T. 1990 : Outbreaks of *Anatipestifer* Infection in Thailand. Proceeding of The 7th FAVA Congress. Pattaya, Chonburi Province. November 4-8.

7. Pathanasophon, P., Tanticharoenyos, T. and Morozumi, T. 1991 : Identification of *Pasteurella anatipestifer* by API-ZYM. Thai J. Vet. Med. 21(4) December.

8. Pathanasophon, P., Tanticharoenyos, T. and Morozumi, T. 1991: Characteristics and Antimicrobial Susceptibilities of *Pasteurella (Moraxella) anatipestifer* Isolated from Ducks in Thailand. Thai J. of Hlth. Resch 5(1) : 55-61.

9. Pathanasophon, P., Trongwongsa, L. Morozumi, T. and Tanticharoenyos, T. 1990 : Outbreaks of *Anatipestifer* Infection in Thailand. Proceeding of The 7th FAVA Congress.

10. Pathanasophon, P., Trongwongsa, L. Mulika, L. and Tanticharoenyos, T. 1993: An outbreak of Concurrent Aspergillosis and Anatipestifer Infection in Babary. (In Press.)

11. Santivatr, W., Mulika, L. and Tanticharoenyos. T. 1991: Preparation of Salmonella antigen for serolgical diagnosis by Microagglutination test. Proceedings of The 10th Annual Livestock Conference. Department of Livestock Development. Chonburi Province, September 13 - 16.

12. Tanticharoenyos, T. Pathanasophan, P. and Sawada, T. 1993: Certain serotypes of *Pasteurella multocida* in poultry. Thai J. Hlth Resch 7 (1)

1. Chompoochan, T. and Achapet, A. 1991. Fasciola gigantica : A liver fluke in hog deer. Proceedings of the 10th Annual Livestock Conference. Department of Livestock Development. 13-16 September: 515-521.

2. Chompoochan, T., Chaiputpanich, S. and Punmamoung, T. 1992. The endoparasites of wild animals in captivity. Presented: the 13th Annual Conference."Wildlife of Thailand" Faculty of Foresty, Kasetsart University.

3. Chompoochan, T. and Taira, N. 1993. Effect of liquid parrafin against Fasciola metacercaria migration. The 31st Annual Conference Kasetsart University, Bangkhen, Bangkok. 3-6 February: 263.

4. Indrakamhang, P., Thammasart, S. and Apiwatnakorn, B. 1991. Detection of Trypanosomiasis antibody in domestic animal using ELISA technique. The 29th Annual Conference Kasetsart University, Bangkhen, Bangkok. 4-7 February.

5. Indrakamhang, P., Apiwatnakorn, B. and Prasitiratana,P. 1991. Treatment of babesiosis in experimental calves. Abstrcts of the 10th Annual Livestock Conference, Department of Livestock Development. 13-16 September :39.

6. Indrakamhang, P., Chiensumai,K., and Punmamoang, T. 1991. Effect of albendazole upon gastro-intestinal infection in lactating dairy cow. Abstracts of the 10th Annual Livestock Conference, Department of Livestock Development. 13-16 September : 117.

7. Prasitiratana, P.,Laohapichatchai, S., Charngthong, C. and Tongyai, S. 1991. Studies on appropiate culture media for diagnosis of Trichomoniasis. Proceeding of the 10th Annual Livestock Conference. Department of Livestock Development. 13-16 September:363-376.

8. Prasitiratana, P.,Neramitmansuk,W.,Thonasuth, S.,Punmamoang,T. and Mokaew, K. 1991. Diagnosis of Trichomoniasis in cattle and buffalo. Proceedings of the 10th Annual Livestock Conference. Department of Livestock Development. 13-16 September: 377-387.

9. Sarataphan, N.,Sukhapesna,V., Tuntasuvan, D. and Nishikawa, H. 1989. Isolation and development of Babesia antigen for serological tests. The 27th Annual Conference, Kasetsart University, Bangkhen, Bangkok, 4-7 February.

10. Sarataphan, N., Tada, Y., Sutherat, S.and Chanprasert, B. 1992. Preliminary report on experimental infection of blood fluke (Schistosoma spindale) in calf. Abstracts of the 11th Annual Livestock Conference, Department of Livestock Development. 16-19 September: 26-27.

11. Sarataphan, N. and Tada, Y. 1992. Biology of wild animal ticks Haemaphysalis (K) laqrangei from Phukieo wildlife sanctuary. Presented: The 13th Annual Conference." " Wildlife of Thailand" Faculty of Foresty, Kasetsart University.

12. Sukhapesna,V. 1990. Anthelminthic activity of Mahad against parasites in cattle calves, buffalo calves and lambs. Journal of the Thai Veterinary Medical Association under Royal Patronage. 42(1): 21-25.

13. Sukhapesna,V., Tuntasuvan, D. and Suriyajantratong,W. 1991. Anthelminthic activity of closantel against Fasciola gigantica and other parasites in cattle. The Thai Journal of Veterinary Medicine. 21(3): 165-171.

14. Sukhapesna,V. 1991. Efficacy of ivermectin against ectoparasites and endoparasites of swamp buffalo. Journal of the Thai Veterinary Medical Association. 42(3): 139-145.

15. Sukhapesna,V., Sarataphan,N. and Tuntasuvan,D. 1992. Anthelmintic activity of triclabendazole against Fasiola gigantica in cattle and buffaloes. Abstracts of the 13th Annual Veterinary Sience Conference. 4-6 November: 7-8.

16. Sukhapesna,V. 1993. Anthelmintic activity of nitroxynil against Fasciola gigantica in cattle and buffaloes. The 31st Annual Conference Kasetsart University, Bangkhen, Bangkok. 3-6 February: 265.

17. Tuntasuvan,D., Sarataphan,N., Nakamura, K., Nishikawa, H. and Mokaew, K. 1992. Efficacy of sulfamonomethoxine for control of Toxoplasmosis on breeding sows. Abstracts of the 11th Annual Livestock Conference, Department of Livestock Development. 16-19 September: 26-27.

18. Tuntasuvan,D. 1992. Western blot analysis of Fasciola hepatica peak A antigen. Abstracts of the 19th Annual Veterinary Science Conference. 4-6 November: 7-8.

19. Tuntasuvan,D. 1992. The preparation of specific Fasciola hepatica antigens for the detection of Bovine Fascioliasis by ELISA. Abstracts of the 19th Annual Veterinary Science Conference. 4-6 November: 110-113.

20. Tuntasuvan,D. 1993.Ovine Fascioliasis test by ELISA and western blot technique using Fasciola hepatica peak A antigen. The 31st Annual Conference, Kasetsart University, Bangkhen, Bangkok. 3-6 February: 264.

Immuno-serology Section

1. Apiwatnakorn, B., Supcharoen, A, Ekgatat,M. and Gesornsombat,D. 1993 : Bluetongue antigen preparation for agar gel immunodiffusion test 1993 : Proceedings of The 12th Annual Livestock Conference: Department of Livestock Development. Prachuapkhirikhan Province. July 21-24.

2. Ekgatat, M., Meephuch, Y. Gesornsombat, D., Sirivan, C. and Smitanon, J. 1991. Paratuberculosis in dairy cattle : 1. Sero-epidemiological studies of paratuberculosis J. Thai Vet. Med. 42(1) : 7-12.

3. Ekgatat, M., Gesornsombat, D. and Charngthong, S. 1991: The Addition of EDTA for Brucellosis Diagnosis in Cattle. J. Thai Vet. Med. Assoc. 42(4) : 225-229

4. Ekgatat, M., Gesornsombat, D., Tanticharocnyos, T. and Apivatnakorn, B. 1992 : Mycobactin J Preparation for Isolting Medium of *Mycobacterium paratuberculosis*. Thai J. Vet. Med. 22(1) : 35-41.

5. Ekgatat, M., Kanameda, M. Gesornsombat, D. Thammasart, S., Suwancharoen, D. Kashemsant, N., Yokomizo, Y. 1992 : Comparison of Enzyme-linked Immunosorbent Assay and Complement Fixation Test for Serodiagnosis of Bovine Paratuberculosis. Abstracts of The 11th Annual Livestock Conference, Department of Livestock Development. Chiangmai Province, September 16-19.

6. Ekgatat, M., Gesornsombat, D., Apiwatnakorn, B. Suwancharoen, D., Kanameda, M. and Yokomizo, Y. 1993 : Preparation of paratuberculosis antigen for complement fixation test. Abstracts of The 31th Kasetsart University Annual Conference. February 3-6.

7. Gesornsombat, D., Ekgatat, M., Charngthong, S. 1991 : The Comparison between Heat and 2 - Mercaptoethanol for destroying Immunoglobulin M in Vaccinated Brucellosis strain 19 Heifers. Proceedings of The 10th Annual Livestock Conference, Department of Livestock Development. Chonburi Province, September 13-16. p 545-551.

8. Gesornsombat, D., Tanticharoenyos, T., Pemayodhin, P., Ekgatat, M., Kongkrong, C. Meephuch, Y., Klainin,P. and Kanameda, M.1992 : Screening of Bovine Paratuberculosis in Thailand. Abstracts of The 11th Annual Livestock Conference, Department of Livestock Development. Chiangmai Province, September 16-19.

9. Gesornsombat, D., Apiwatnakorn, B. Thammasart, S. Suwancharoen, D. Kashemsant, N., Axayuth, K. Charngthong,S. 1993 : Paratuberculosis in Cattle : 4 Specificity of Johnin and Complement Fixation Test for Detecting Paratuberculosis. Abstracts of The 31th Kasetsart University Annual Conference. February 3-6.

10. Thammasart, S., Chompoochan, T. 1991 : Chromosomal Studies in Lymnaea Species, Intermediate Hosts of Cattle and Buffalo Liver Fluke. J. Thai Vet. Med. Assoc. 42(2) : 61-69.

11. Thammasart, S., Chompoochan, T. and Ekgatat, M. 1991 : Control of Cattle and Buffalo Liver Fluke Through Control of an Intermediate Host, Lymnaeid Snail Ic. Immunological characteristic studies on the Lymnaea snail intermediate hosts of fascioliasis in cattle and buffaloes. Abstracts of The 29th Annual Conference, Kasetsart University. February 4-7.

12. Thammasart, S., Wongkashemchit, S. and Ekgatat, M. 1991 : Horseradish Peroxidase conjugated Preparation for Trypanosomiasis Diagnosis in Domestic Animals Using ELISA. : Abstracts of The 29th Annual Conference, Kasetsart University. February 4-7.

Collaborative Activity

13. Kanameda, M. and Ekgatat, M. 1993 : Isolation of *Mycobacterium bovis* from the swamp buffalo (*Bubalus bubalis*). Proceedings of The 12th Annual Livestock Conference, Department of Livestock Development, Prachuapkhirikhan Province July 21-24. (Submitted ; Tropical Animal Health and Production.)

Toxicology and Biochemistry Section

1. Bintvihok, A., Hayashi, M. and Nagasawa, s. 1991: Effects of Aflatoxin B_1 in Ducklings: Effect on Hepatic Microsomal Drug Metabolizing Enzymes. Proceedings of Australia Center for International Research (ACIAR) No. 36. p. 230 - 232.

2. Bintvihok, A., Shoya, S. , Sutherat, S., Nagasawa, S. and Sato, M. 1991: Effects of Aflatoxin B_1 in Ducklings: Effect on Liver Lesions. Proceedings of Australia Center for International Research (ACIAR) No. 36 p. 233 - 235.

3. Bintvihok, A., Intraraksa, R., Sookthinthai, L., Hirano, K., Adachi, Y. and Hayashi, M. 1991: Development of ELISA for Aflatoxin B_1 Detection in Cattle and Buffalo Serum in Thailand. Proceedings of The 10^{th} Annual Livestock Conference, Department of Livestock Development. p. 388-398.

4. Bintvihok, A., Klainin, P. , Intraraksa, R. and Sutherat, S. 1991: Aflatoxin Detoxification by Mycoinhibitor. Proceedings of The 10^{th} Annual Livestock Conference, Department of Livestock Development. p. 522-532.

5. Bintvihok, A., Uaphau, D., Klainin, P. Intraraksa, R. Sutherat, S. Wisutharom, K., Boonmeerod, M. and Hayashi, M. 1991: Aflatoxin and toxic residue : its influence with regard to Jeopardize the chicken and tissues. J. Thai Vet. Med. Assoc. 42(4) : 209 - 217.

6. Bintvihok, A. and Hayashi, M. 1992 : Development of ELISA for aflatoxin B_1 detection : preliminary experiment of enzyme linked immunosorbent assay for detection fo aflatoxin B_1 in cattle and buffalo sera in Thailand. Recent Advances in Toxicology Research. 3 : 233-241.

7. Bintvihok, A., Pramoonsinsup, T., Hayashi, M. and Ogura, Y. 1992: Production of Aflatoxin B_1 antibody for ELISA Detection in Thailand. Proceedings of the 11th Annual Livestock Conference, Department of Livestock Development, Chiengmai Province, September 16-19. In press.

8. Bintvihok,A., Sugano,K., Intraraksa, R.,Thanacharoenwatch,P., Sookthinthai, L.,Wongsuthawad, S. and Bintvihok, R. 1992: Comparative Determination of Aflatoxin B_1 in Animal Feed by Using Densitometer, HPLC and ELISA. Proceedings of the 11th Annual Livestock Conference, Department of Livestock Development, Chiengmai Province, September 16-19. In press.

9. Bintvihok, A., Klainin, P., Thummabood, A., Kositcharoenkul,S., Bintvihok, R., Wongsuthawad, S., Intraraksa, R. and Ogura, Y. 1993 : Effects of aflatoxin B_1 on serum enzymes, blood urea nitrogen and total protein in laying quails. Proceedings of the 12th Annual Livestock Conference, Department of Livestock Development, Prachuapkhirikhan Province, July 21-24. In press.

10. Bintvihok, A., Thiengnin, S., Patchimasiri, T., Thummabood, S. Shoya, S., Ogura, Y., Kumagai, S. and Doi, K. 1993 : Toxic effects of dietary aflatoxin and its residue in tissues and eggs in laying quails. Proceedings of the 11th International Symposium of World Association of Veterinary Food Hygienist (WAVFH) Bangkok, Thailand. October 24-29. In press.

11. Intraraksa, R., Teeranusonti, M. and Uttasart, S. 1991 : A Quantitative Analysis of Chlorinated Hydrocarbon Insecticides in Poultry and Swine Commercial Feed. Abstract of the 10th Annual Livestock Conference, Department of Livestock Development. p. 570-580.

12. Intraraksa, R., Arsayuth, K., Teeranusonti, M. Klainin, P. and Pemayodhin, P. 1992 : Aldicarb and Carbofuran Toxicosis in Beef Cattle Proceedings of the 11th Annual Livestock Conference, Development of Livestock Development, Chiengmai Province, September 16-19. In press.

13. Intraraksa, R., Pramoolsinsap, T. Kongkrong, C, Uttasart, S. and Ratanaphan, A. 1992 : Chronic Copper Poisoning in Sheep. Proceedings of the 19th Veterinary Science Annual Conference, J. Thai Vet. Med. Assoc. November 4-6. In press.

14. Intraraksa, R., Sirivan, C., Klainin, P. Uttasart, S. Phoengpong, N. Teeranusonti, M. and Wongkasenchit,S. 1993 : A certain biochemical characteristic concerning with infectility problem in dairy cattle. Proceedings of The 12th Annual Livestock Conference Department of Livestock Development. Prachuapkhirikhan Province. July 21-24. In press.

15. Klainin, P., Uttasart, S. and Phoengpong, N. 1992 : Study on Biochemical Values in Cattle Serum : Determination of OCT, Gamma-GTP and SGOT Enzymes in Cattle. Proceedings of The 30th Kasetsart University Annual Conference, January 29-February 1. p. 431-441.

16. Phoengpong, N., Intraraksa, R. Klainin, P. and Hayashi, M. 1990 : Serum Copper Concentrations of Cattle in Thailand. Proceedings of The 7th Federation of Asian Veterinary Association Congress, Pattaya, Chonburi Province, November 4-8. p. 235-242.

17. Uttasart, S., Teeranusonti, M., Klainin, P.. 1992 : Study on Biochemical values in Cattle Serum : Protein Level in Cattle. Proceedings of The 30th Kasetsart University Annual Conference. January 29-February 1. p. 421-429.

Epidemiology Section

1. Meephuch, Y., Musikul, P. and Smitanon, J. 1992 : Survey of Tuberculosis and Early Stage of Paratuberculosis in Dairy Cattle in Central Part of Thailand using Skin Test. Proceedings of The 30th Kasetsart University Annual Conference. January 29-February 1. p. 373-384.

2. Pemayodhin, P., Ekgatat, M. and Gasornsombat, D. 1992 : Brucellosis Status in Cattle, Buffaloes and Swine During 1989-1991. Proceedings of The 30th Kasetsart University Annual Conference. Jan 29-Feb 1. p. 481-487.

3. Pemayodhin, P., Sirivan, C. and Mahantachaisakul, C. 1991 : Epidemiological Study of Tick Fever Disease in Beef Cattle's Farm. J. Thai Vet. Med. Assoc. 42(3)131-137.

4. Sirivan, C., Pemayodhin, P., Tanticharoenyos, T. and Srichamroon, S. 1992 : Tuberculin skin testing of suspected swamp buffaloes. Abstract of The 11th Annual Livestock Conference, Department of Livestock Development, Chiangmai Province September 16-19.

5. Sirivan, C. and Pemayodhin, P. 1993 : Foot and mouth disease Type O in Thai elephants. Proceedings of The 12th Annual Livestock Conference, Department of Livestock Development, Prachuapkhirikhan Province, July 21-24.

6. Sirivan, C. Pemayodhin, P., Mulika, L. and Kongkrong, C. 1993 *Erysipelothrix rhusiopathiae* infection in swine and man: Proceedings of The 12th Annual Livestock Conference, Department of Livestock Development, Prachuapkhirikhan Province July 21-24.

7. Smitanon, J., Meephuch, Y., Musikool, P. and Thiratinaratana, P. 1992 : Incidence of some important diseases in imported cattle during 1990-1991. Proceedings of the 30th Kasetsart University Annual Conference, January 29-February 1, p. 367-372.

SUMMARY REPORT OF THE JOINT-EVALUATION ON THE NATIONAL ANIMAL HEALTH PRODUCTION INSTITUTE PROJECT IN THAILAND

1. Objectives of The Evaluation

1.1 Objectives of Evaluation

(1) To evaluate the accomplishment of the Project for the two- year extension period from December 9th 1991 to December 8th 1993 in accordance with the R/D and the TSI for the Project.

(2)To make recommendations and suggestions on the post-project activities to the relevant authorities of the two governments.

1.2 Method of Evaluation

Evaluation was conducted by the Team through interviews and discussion with personnel involved in the Project and visits to relevant facilities.Evaluation of the Project activities was done based on the TSI for extension.

The following items were considered for evaluation :

A. Input to the Project

(a) Japanese Contributions

(i) Dispatch of Japanese Experts
(ii) Training of Thai Personnel
(iii) Provision of Equipment
(iv) Local Running Cost and Others

(b) Thai Contributions

(i) Staff Allocation
(ii) Land, Building and Facilities
(iii) Operating Cost

B. Activities of the Project

B-1. Determination of the cause of low productivity and economic losses.

(1) Compilation and analysis of field data.
(2) Diagnosis and chemical analysis of field materials
(3) Establishment of fundamental laboratory techniques
(4) Etiological research

B-2 Development of countermeasures

B-2-1 Development of diagnostic techniques
B-2-2 Development of biological products
B-2-3 Development of analytical methods of feedstuff, feed additives and toxic substances

B-3 Research on FMD

B-3-1 Research on diagnostic methods
B-3-2 Research on improvement of the vaccine

B-4 Supporting services

B-4-1 Management of experimental animals
B-4-2 Information services including library management
B-4-3 Extension services including training of technical personnel

C. Impact of the Project
D. Administration of the Project
E. Sustainability of the Project
F. Conclusion and recommendations

1.3 Evaluation Schedule

The Joint Evaluation Schedule appears as Annex 1.

2.Members of the Joint Evaluation Team

2.1 Japanese Evaluation Team

(1) Dr. Takaaki SUGIMURA(Leader/Animal Health Research)
Director, Exotic Disease Research Division, NIAH, MAFF.

(2) Dr. Isao NONOMURA(Diagnostic Service)
Chief , Feed Microbiology Section,Feed Safety Research Division,NIAH,MAFF.

(3) Dr.Yosuke MURAKAMI(Diagnosis and Prevention Epidemiology Technic)
Chief,Diagnostic Laboratory ,Exotic Disease Research Division, NIAH, MAFF.

(4) Mr.Yoshiaki NISHIKAWA(Cooperation Impact)
Chief of Project Planning Section, International Cooperation Division. Economic Affairs Bureau, MAFF.

(5) Mr.Masahito NISHIGUCHI(Coordinator / Planning Evaluation)
Staff, Livestock Technical Cooperation Division , Agricultural Development Cooperation Department,JICA

Remarks
JICA : Japan International Cooperation Agency
MAFF : Ministry of Agriculture, Forestry and Fisheries
NIAH : National Institute of Animal Health , MAFF

2.1 Thai Evaluation Team

(1) Dr. Wipit CHAISRISONGKRAM (Leader)
Deputy Director - General, DLD, MOAC.

(2) Dr. Vises PRASERT
Director, Regional Livestock Officer, Region 8, DLD, MOAC.

(3) Dr. Yukol LIEMLAEMTHONG
Director, Planning Division, DLD, MOAC.

(4) Dr. Raweewan YINGVANSIRI
Chief, Planning and Budgeting Sub-Division, Planning Division, DLD, MOAC.

(5) Dr. Wimolporn THITISAK
Chief, Foreign Relation Sub-Division, Planning Division, DLD, MOAC.

(6) Ms. Sutisa CHOONHARAUNGDEJ
Programme Officer, DTEC.

(7) Ms. Rattana CHANTANAKORN
Programme Officer, DTEC.

(8) Ms. Priya REONMONGKOL
Chief, Monitoring and Evaluation Sub-Division, DTEC.

(9) Ms. Nongnootch THONGTAN
Foreign Agricultural Relations Division, Office of the Permanent Secretary, MOAC.

(10) Ms. Sineenart KHOVITOONKIJ
Foreign Agricultural Relations Division, Office of the Permanent Secretary, MOAC.

Remarks
MOAC : Ministry of Agriculture and Cooperatives
DLD : Department of Livestock Development, MOAC
DTEC : Department of Technical and Economic Cooperation

2.2 Chairman **Co-Chairman**

Dr. Takaaki SUGIMURA Dr. Wipit CHAISRISONGKRAM

3. Evaluation Results

3.1 Summary

The following is a summary of the achievement of the Project for the seven (7) year cooperation period.

3.1.1 Based upon the R/D signed on December 9th 1986, the Governments of Japan and Thailand have implemented a five-year technical cooperation programme. The period of the technical cooperation was extended for another two (2) years from December 9th

1991 through December 8th 1993, according to the R/D on extension of the Project signed on October 7th 1991.

3.1.2 For the Grant Aid project on "The Establishment of NAHPI", building and equipment equivalent to 1,785 and 572 million yen, respectively, were provided by the Japanese Government in 1986. The Project carried out at NAHPI, Bangken, Bangkok and FMD center, Nong Sarai, Pakchong, Nakornrachasima.

3.1.3 The objectives of the Project are to promote research and investigation activities on animal health and production at NAHPI as well as at FMD center, and thus to contribute to livestock development in Thailand.

3.1.4 In the initial stage of the Project, a large effort was paid for the organization and development of fundamental technology of research and diagnosis. In the latter stage, emphasis was shifted to collaborative research program on major diseases as well as strengthening of diagnostic services.

3.1.5 Following the recommendation by Thai-Japan Joint Evaluation Team, August, 1991, implementation period of the Project was extended for another two (2) years after December, 1991. In the extension period, emphasis have been placed on promotion of the collaborative research program and establishment of reference, information and technology-transfer services.

3.1.6 The overall Project achievement for the seven (7) year cooperation period is shown below ;

(a) Fifty-seven (57) Japanese experts were dispatched for technology transfer to Thai counterparts.

(b) Forty-four (44) Thai counterparts were trained in Japan.

(c) Laboratory equipment valued at 474.8 million yen were provided by the Government of Japan.

(d) Local costs and Special programs valued at 53.4 and 32.3 million yen were provided by the Government of Japan, respectively.

(e) In 1986-1993, the Government of Thailand provided the budget of 152.2 million bahts for NAHPI operation.

A. Input to the Project during extension period (1991-1993)

(a) Japanese contributions

(i) Dispatch of Japanese experts

A total of fourteen (14) Japanese Experts consisting of five (5) long-term and nine (9) short-term experts, have been dispatched or involved in the Project during the extension period. Other three (3) short-term experts are scheduled to be dispatched by the end of this Project period. Most experts have effectively contributed to progress of the Project.

(ii) Training of Thailand Personnel in Japan

A total of ten (10) of counterpart personnel have been trained in Japan and two (2) more counterparts are expected to go for study tour in Japan. These counterparts have contributed to the manpower development of NAHPI and FMD Center.

(iii) Provision of Equipment

A total sum of 54 million yen is scheduled to be spent to provide equipment for the Project by the end of this project period. Equipment provided so far by the Government of Japan is effectively used. However, some problems concerning maintenance are still remained. Major equipment is listed in Annex 4.

(iv) Local Expense and Special Programs

A sum of 34.2 million yen is scheduled to be spent by the Government of Japan to supplement the local expense and Special Programs of the Project. These local expenses were mainly to facilitate the activities of experts and counterparts such as laboratory materials, small equipments and so on. Special Programs include modification and repair of building, seminar, training course and publication for extension. The detailed Japanese contribution appears in Annex 5.

(b) Thai Contributions

(i) Staff Allocation

The number of staff at the NAHPI is 142 in the research division and 65 in the administration division(207 of total) at the time of evaluation. The Government of Thailand has taken responsibility in respect of arranging the number of staff that are necessary for the smooth implementation of the Project. The present staff for NAHPI is shown in Annex 6.

(ii) Land, Building and Facilities

Land, buildings and facilities necessary for implementation of the Project were provided by the Government of Thailand with the support of Japanese grant aid. NAHPI has maintained the condition of building and facilities under the allotted local budget.

(iii) Operating Cost

Operating cost is under the Thai local budget for the project management. The allotted budget of the Division of Veterinary Research has been re-allotted to the Project contribution for the expenses and temporary employee payment. In 1992, a sum of 23,978,500 bahts has been expended for the local budget. In 1993, a sum of 30,788,900 bahts was expended. The detailed Thailand local budget appears as Annex 7. Because of limited local budget, maintenance of equipment and facilities has been difficult. Some support by the Government of Japan enabled the Project activities continue smoothly.

B. Activity of the Project

B-1. Determination of the cause of low productivity and economic losses.

During the initial 5 years of the project,activities described in B-1-1 were mainly conducted to establish basic,fundamental function of every laboratory. After the establishment,activities were concentrated on the major subjects for extended period ,which is described in B-1-2.

All publications and presentations are listed in Annex 8.

B-1-1 The activities (1) - (4) were performed relatively well in each section on the subjects listed in Annex 9.

(1) Compilation and analysis of field data.
(2) Diagnosis and chemical analysis of field materials.
(3) Establishment of fundamental laboratory techniques.
(4) Etiological research

B-1-2 During extended period, main efforts were concentrated on the major subjects which were considered to have high priority and required systematic,interdisciplinary and collaborative approach.

B-1-2-1 Swine fever

Indispensable techniques for laboratory diagnosis and epidemiological analysis of swine fever have been successfully developed as follows; immunofluorescence for detection of virus antigen, micro-neutralization assay, END method and ELISA for detection of specific antibody. Mabs directed to SF virus being applicable to laboratory diagnosis, have also produced and characterized. These techniques are fully utilized to make clear the situation of SF in Thailand.

A lot of epidemiological findings being essential for the control of SF, such as the number of outbreaks, source and time of infection, morbidity and mortality rates, and the presence of persistent infection of SF has been gradually clarified through a long-term field investigation during 1986 to 1991. Furthermore, atypical SF with high morbidity but low mortality has been found out through epidemiological and pathological examinations.These findings are fully utilized for control of SF in Thailand.

An immune status of SF in pigs has been studied through survey of maternal antibody with Chinese strain and protection experiments with field isolate. Further epidemiological survey to cover the whole country and establishment of pig health scheme for the control of SF should be established.

B-1-2-2 Copper deficiency :Low level copper in cattle.

Copper levels of serum in cattle in Thailand are significantly low compared with those in other countries on the reference. Majority of the cattle with low copper level in serum showed no evidence of abnormality. However, in 1993, some American Brahman cattle with low cooper level in serum were found to show clinical signs such as unthriftiness, weakness, recumbency and unable to stand, and 50% death occurred.

Attempt of field surveillance on copper deficiency of cattle was relatively well performed. Long time monitoring of copper level in cattle should be continued, and development of countermeasure should be attempted.

B-1-2-3 Paratuberculosis

A total of 17,655 cattle sera were tested by CF test and 602 (3.4%)animals were positive. The positive reactors were found in all of the four Regions. Bacteriological diagnosis was carried out. 109 isolates were obtained from 189 specimens submitted from suspected cattle. Pathological examination was performed on 6 suspected cattle:some with distinct change of paratuberculosis,the others without any sign of the disease.

ELISA was applied to 541 CF tested sera. Of the 463 CF reacted sera, only 23 sera reacted on the paratuberculosis ELISA. All of 78 CF negative sera were also negative on ELISA. From these results, specificity of CF test seems to be unsatisfactory. The research activity on this subject seems to be well performed.

It is recommended that since CF test seems to be less specific than ELISA , for the screening test of the disease in the wider area of the field, ELISA should be employed. For a surveillance, production of ELISA antigen and evaluation of reliability of the antigen should be established.

B-1-2-4 Imported cattle health project

Cooperation among Epidemiology, Immunology, Parasitology, Virology and Bacteriology sections is regularly performed to investigate some important diseases in imported cattle in cooperation with Division of Disease Control/DLD. Epidemiology section is responsible for sample submission, investigation, surveillance and data collection. Tuberculosis, Paratubrculosis, Brucellosis, Blue tongue and blood parasites are routinely examined. Further efforts are needed on this subject as well as the health control scheme.

B-2. Development of countermeasures

B-2-1 Development of diagnostic techniques.

Mab and ELISA are used for diagnostic purpose in some sections. Application of biotechnology or genetic engineering is started for improvement

in diagnosis of diseases. Few trials were made in this field. Further attempts should be continued.

B-2-2 Development of biological products.

Biological products developed are listed in Annex 10. Attempts were made on a lot of biologics production, but the reliability of the products have not been evaluated because of insufficient technology. It is recommended that quality control of the products should be established.

B-2-3 Development of analytical methods of feedstuffs , feed additives and toxic substances.

Concentration of aflatoxin, minerals, vitamins can be determined. Biochemical analysis of feedstuffs can be made routinely. In this field, techniques were relatively well performed.

B-3 Research on FMD

Research activities on FMD have been held at FMD Vaccine Production Center, during two years extended period under the NAHPI Project. The activities have been focussed on following two research items, diagnostic method and improvement of vaccine quality, to make FMD control more effectively.

B-3-1 Research on diagnostic method.

Production of Mabs directed to FMD virus types O and Asia-1 has been completed. They were characterized and applied to the analysis of antigenicities of the field viruses. Modern diagnostic method, serotyping ELISA using the Mabs to type O virus, has been successfully established. These techniques are already transferred to the counterparts and practically applied to routine diagnosis of FMD at diagnostic section of the center. They practically contribute to the field survey of FMD outbreaks. Genetic diagnosis such as PCR is now planned to be developed.

B-3-2 Research on improvement of vaccine quality.

Comparison of r-values between vaccine strains and viruses isolated from 1990 to 1992, have been successfully carried out to estimate the efficacy of current vaccines. These progresses are practically utilized for estimation and selection of vaccine virus in Thailand. In order to obtain basic

information required for the development of genetically constructed vaccine such as cheimeric virus vaccine, production and characterization of antibody-escapemutants of type O virus have been successfully conducted using neutralizing Mabs.

Genetic approaches on FMD virus should be carried out in cooperation with modern, sophisticated laboratory.

B-4 Improvement of Supporting Services

Activities on supporting services in NAHPI has been carried out in the sites of three sections, experimental animal unit, information section including library management, and extension and technical transfer services which are all indispensable to establish and sustain active research.

B-4-1 Management of experimental animals

In the experimental animal unit, following supporting services are established for researches of NAHPI; production and supplying of inbred BALB/c mice, outbred ICR mice and Hartley guinea-pig, and taking care of other experimental animals; rabbit, chicken, duck, cattle, pig and others. The activities in maintenance of disinfected animal unit were expanded to cover the requirement of experimental animal from other government offices.

Problems in the management of this unit, inadequate space for animal sheds or closely located autopsy and incinerator units coming from improper design of the unit, should be solved. These problems may disturb not only supporting service activities but also establishment of this unit as a laboratory animal science section of NAHPI. Production and maintenance of SPF or germ-free animals should be established for the future research works.

B-4-2 Information services including library management.

For disease information service, computerized information system using standardized format on disease diagnosis has been established at NAHPI in combination with three regional VRDCs. Publication activities on official reports, such as Annual Report and Newsletter of NAHPI, and Leaflet for disease information have advanced. In order to establish information system of important animal disease in Thailand, NLIC with functions as livestock information center, technical service and data network in DLD, has been established at NAHPI on May, 1992. However, standardization of diagnostic

procedure of each disease is necessary for these information services. More efforts should be done to improve the function of NLIC.

For the reference services, a number of reference or type strains is collected, stored and listed. Antisera to them were also prepared and utilized for serotyping of isolates. In several diseases as well as Johne's disease, reference service to supply the diagnostic reagents has started. The system of reference service should be, however, improved and strengthened to improve the diagnostic and research capability of regional VRDC.

For the library management, collection, maintenance and circulation of respective scientific books, journals and reference materials have been improved according to the financial efforts made both by Thai and JICA sides. More than 21 journals and 211 books were collected at library in NAHPI. Inter-library loans are also available. Further effort is necessary to expand library activities by Thai-budget in the future.

B-4-3 Extension services including training of technical personnel.

Extension and technical transfer services to the researchers of NAHPI, veterinary officers and personnels in DLD, and those other organizations have been constantly provided through a number of seminar and training courses held at NAHPI. During extended two years, ten training courses, four third country trainings, and more than thirteen scientific seminars and lectures were held at NAHPI. They contribute to the improvement in this field both inside and outside of Thailand.

To strengthen the technical transfer activities, researcher at NAHPI should make further efforts to publish the results obtained from research and diagnostic works.

C. IMPACT OF THE PROJECT

C-1 The Project has been able to create significant impact on the institution building of the Animal Health and Production Institute and on the improvement of fundamental laboratory techniques for research and investigation activities of animal health.

C-2 For the extension period, research works including four main diseases were improved by assistance and guidance of experts. Regarding activities on research, good results has been obtained. The details are stated in section B and annexes 8 and 9.

C-3 23 Long term experts and 34 short term experts are dispatched to Thailand during the last seven years up to the time of evaluation, and three more short term experts are planned by the end of cooperation. Advice and guidance provided by Japanese experts to Thai counterparts had enabled them to plan and implement research and investigation activities by themselves in respective areas. Details of dispatch of experts are shown in Annex 2.

C-4 Team Leader of Japanese Experts and Coordinator are counterparts to the Director of NAHPI for the administration of the project, and management aspects of the Institute have been transferred.

C-5 42 Thai researchers and managers completed training and/or study tour in Japan during the last seven years up to the time of evaluation, and two more are planned by the end of the Project. They have been exposed to the Japanese scientific ethics and culture as well as technologies themselves. Except for four personnel, all of them have stayed in the Institute after returning from Japan, and have contributed to the improvement of the research and investigation capacity of the Institute. Details of counterpart training in Japan are shown in Annex 3.

C-6 Provision of facilities and equipment through grant aid and technical cooperation have played a key role in this project. It enables the Institute to carry out research and investigation activities effectively and efficiently. It is recognized that maintenance efforts of those equipments are important for further vitalization of activities.

C-7 Technology dissemination activities of NAHPI have been quite active. For example, during the extension period, ten in-house training courses, four third countries training courses, three seminars and several special lectures were conducted, and many publications are implemented using Japanese, Thai and other budget.

C-8 Up to the time of evaluation, transfer of technology through project activities are excellent as reviewed in the Section B of this report. There are some topics to be proceeded further with more emphasis on standardization of technology and dissemination of investigation technology to the regional VRDCs.

D. Administration of the Project

D-1 Under the Seventh National Economic and Social Development Plan, the policy is to enhance and encourage the farmers to replace the infertile crop growing land of the country by animal raising. Therefore, NAHPI has to be expanded to serve this responsibility.

D-2 Since 1986 when the Institute was established research and investigation activities have been successfully conducted at NAHPI by Thai staff members with the assistance of Japanese experts, and after the termination of the Project, it will be possible for Thai staff members to carryout most of the basic activities by themselves.

D-3 The Joint Committee should meet at least once a year to formulate the annual work plan of the project and to review the overall progress under the R/D. Six Committees were held during cooperation period up to the time of evaluation. They have made substantial contribution towards the planning and monitoring of the Project. The Seventh Committee is due to be held on July 19th, 1993 and this evaluation results will be presented.

D-4 While total number of staff for NAHPI was 105 , within which research and administration sections had 66 and others were workers at the time of its establishment in 1986, Number of staff at the Institute is 207 at the time of this evaluation. Among them 142 are in research sections and 65 are in administrative section. 76 of technical staff and 11 of administrative staff are permanent staff organizationally belong to the Veterinary Research Division and the rest are temporary staff directly employed by NAHPI.

D-5 17 vacant positions need to be filled. Those sections with vacancies are Pathology, Virology, Bacteriology, Immuno-Serology,Toxicology & Biochemistry, Epidemiology, and Administration section. Enough number of permanent staff is necessary for the sustainability of the Institute.

D-6 At FMD Center, there are 194 staff members and of which 28 are technical officers. This number has been increased from the starting of the project.

D-7 Some difficulties in maintenance of equipment are reported such as difficulty of obtaining spareparts, accidental plugging due to different voltage frequency.

D-8 The amount of budget allocated to NAHPI in 1987 Thai fiscal year was 15,994,500 bahts. The amount allocated each year has been increased with

some fluctuation and is 30.788,900 bahts in 1993. Details of yearly allocation are shown in Annex 7.

D-9 Considerable improvement in management of the Institute has been observed. At the time of establishment in 1986, the Director General of the Department concurrently served as the Director of the Institute.Later in 1991, Director of Veterinary Research Division was assigned as the Director of the Institute. During that time, management was not perfectly effective. Now, independent Director has been assigned and management has been carried out more effectively.

D-10 Department of Livestock Development has proposed the merger of Veterinary Research Division and NAHPI into NIAH in order that the responsibilities of the institute are legally recognized evermore. The process of legalization has been progressed and Civil Service Commission accepted the revised proposal on April 9, 1993, and Budget Bureau also accepted it on April 9, 1993. Before finalization of this authorization, only cabinet approval is being waited, and it will be realized within a few months.

E. Sustainability of the Project

E-1 Institutional Sustainability

E-1-1 Director of the Institute has been assigned during the Project and overall management has been responsibility of him. This will be continued after the termination of the Project.

E-1-2 Many, even not sufficient, permanent and temporary staff are employed for the Institute to carry out research and investigation activities, supporting services, and administration. Vacant positions need to be filled with for more effective activities. Temporary positions will become permanent when NAHPI is authorized as a national institute. Besides, there is a plan to have 180 officers and 90 workers, which are all permanent, after legalization of the Institute.

E-1-3 The new Institute called NIAH will come out of the merger of NAHPI and Veterinary Research Division. This will expand the function of NAHPI and utilize the result of the Project effectively.

E-2 Financial Sustainability

E-2-1 Some of the budget for NAHPI has been allotted to the Veterinary Research Division, and then, re-allotted to the Institute since the establishment. This budget covers temporary employees payment and remuneration expenses and office materials.

E-2-2 Continuous budget allocation to the Institute is necessary for the sustainability of the Institute. By the legalization of the Institute, Direct allocation of budget to NAHPI(NIAH) is expected for efficient utilization of the budget.

E-3 Technological Sustainability

E-3-1 Using equipment and Laboratory facility provided to the project, NAHPI would be able to undertake further research activities. Many modern techniques were transferred to NAHPI staff by experts and through training, therefore NAHPI have basic technologies to carry out research and investigation activities mandated to the institute. In order to facilitate the new and diversified mandates, NAHPI will need further technical insemination in some areas such as standardization of diagnosis and dissemination of technologies.

E-3-2 In FMD Center, the research works which are applied directly for diagnosis and vaccine production can be continued. It is possible for FMD Center to improve the methods of diagnosis and quality of vaccine as a result of the Project. .

F. CONCLUSION AND RECOMMENDATION

F-1 Conclusion

F-1-1 The NAHPI project, which has been jointly conducted by the Department of Livestock Development, Ministry of Agriculture and Cooperatives and the Japan International Cooperation Agency for the past seven years has achieved its objectives and will be completed by the end of the Project period. The Thai Government will basically be able to sustain and continue the maintenance of NAHPI and FMD Center, and most of their research and other activities by allocating necessary staff and budget.

F-1-2 NAHPI will need to take necessary measures in order to carry out diversified responsibilities of the Institute such as standardization of diagnosis and dissemination of technologies and information to the regional VRDCs.

F-2 Recommendation

F-2-1 Early legalization of NAHPI as an autonomous institution under the DLD as NIAH is prerequisite for smooth implementation of the expected expansion of the activities of the Institute as the central laboratory of animal health field of Thailand.

F-2-2 Sufficient number of permanent and temporary staff are expected to be assigned for the expansion of the activities at the Institute.

F-2-3 Necessary budget need to be allocated continuously and directly to NAHPI(NIAH) for the smooth and effective functioning of the Institute.