マレイシア
アセアン家禽病研究訓練計画
平成元年度巡回指導調査団
報告書

平成２年２月

国際協力事業団

マレイシア
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平 成 2 年 2 月

国 際 協 力 事 業 団

ま　え　が　き

国際協力事業団は，アセアン諸国における家禽病の研究及び人材養成を目的としたプロジェクト方式技術協力「マレイシア・アセアン家禽病研究訓練計画」を，昭和61年4月17日から5年間にわたり実施している。

当事業団は，農林水産省家畜衛生試験場の國安主税研究第一部長を団長とする巡回指導調査団を平成2年1月15日から1月27日まで派遣した。本調査団は，プロジェクトの実施状況を調査し，運営上及び技術上の問題点につき必要な指導並びに助言を行うとともに，今後の技術協力計画についてマレイシアの政府関係者と協議を行った。

本報告書は，これらの調査結果をとりまとめたものであり，今後のプロジェクトの円滑な運営のために，参考資料として活用されることを願うものである。

最後に，今回の調査の任に当たられた調査団員各位及び現地においてご協力頂いたマレイシア政府関係者，在マレイシア日本大使館並びに関係者各位に深甚なる感謝の意を表するものである。

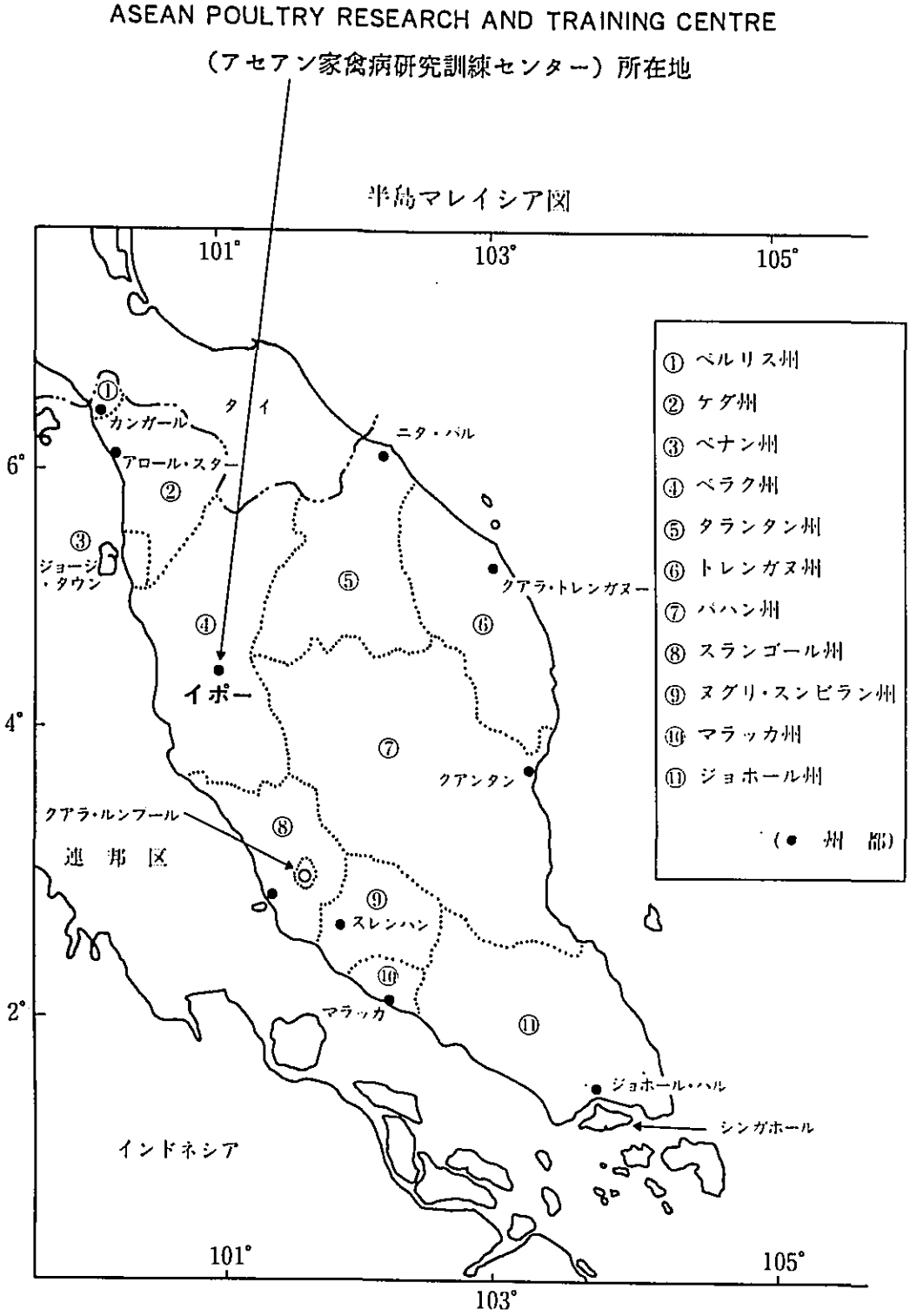
平成2年2月

国際協力事業団

農業開発協力部長

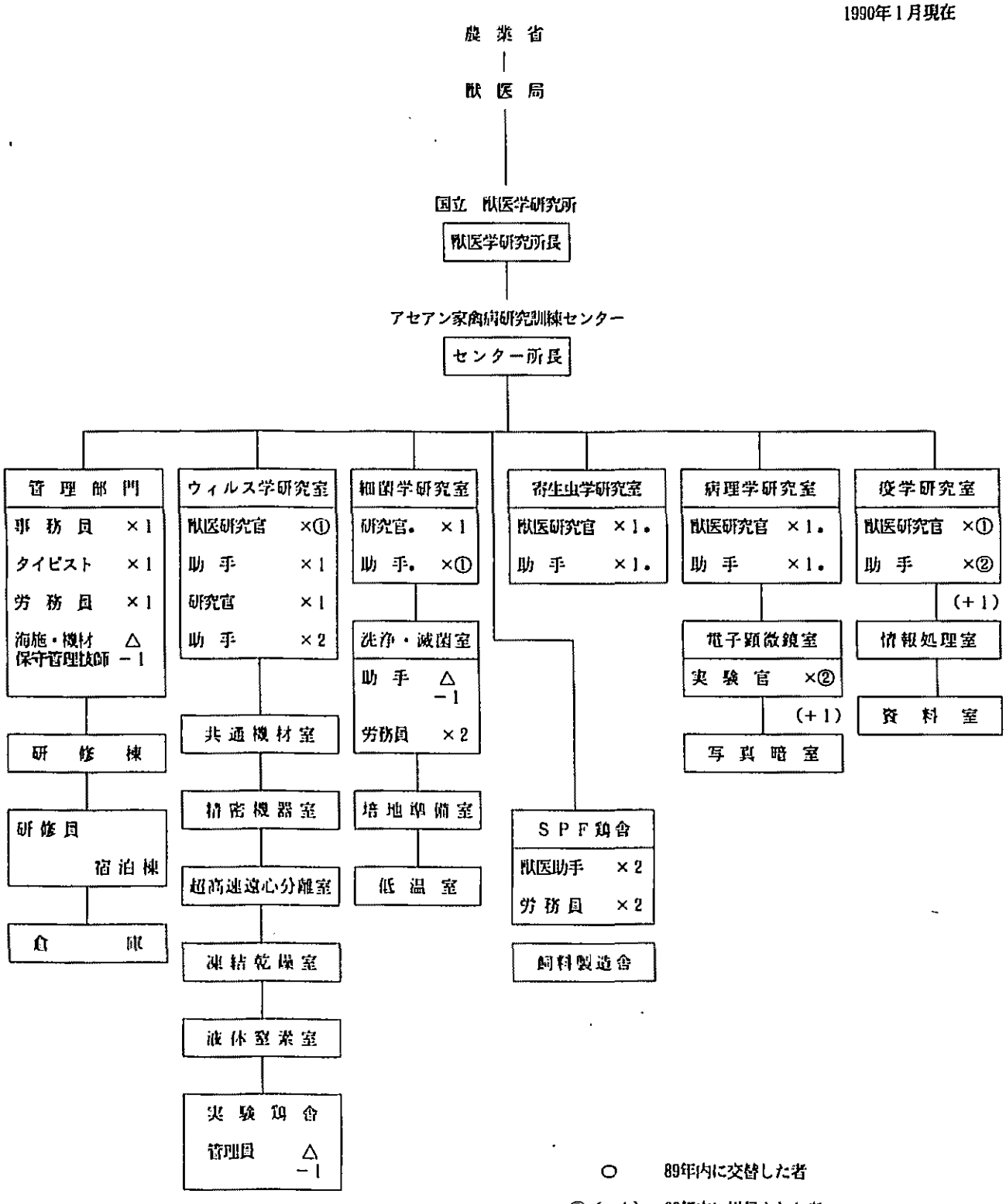
崎　野　信　義

プロジェクト・サイト位置図



アセアン家禽病研究訓練センター組織図

1990年1月現在

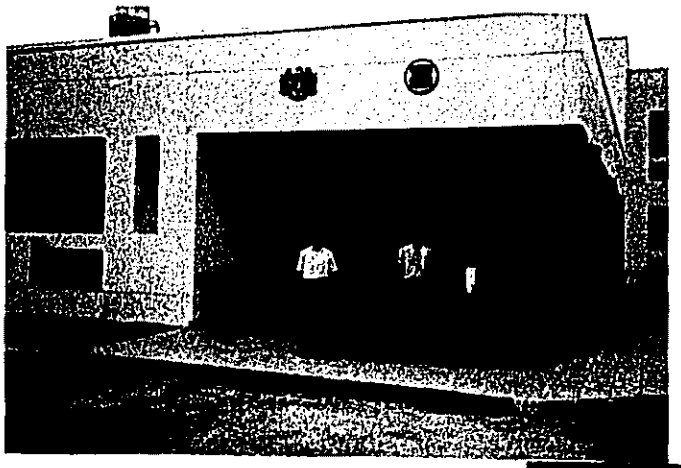


○ 89年内に交替した者

②(+1) 89年内に増員された者

△ 昭和63年度調査団が増員を提言したが配置されていない者

＊ 平成元年度調査団が新たに増員を提言した者

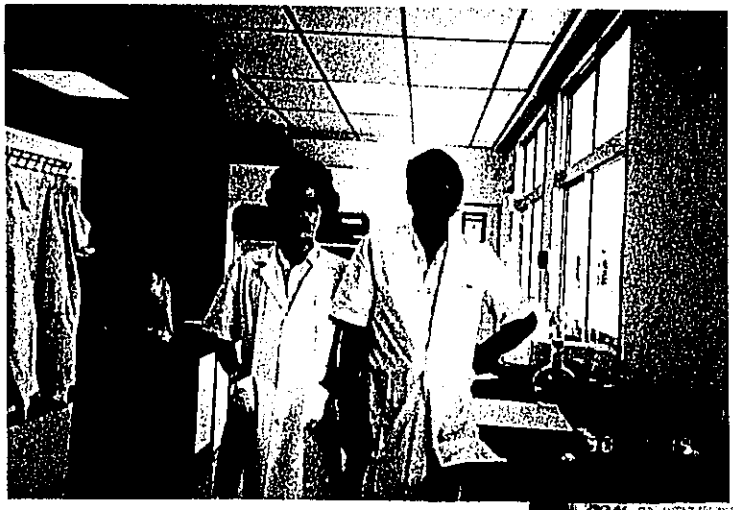


アセアン家禽病研究訓練
センター玄関に立つ調査団
（右から，國安団長，湯浅，
藤崎，草野の各団員）

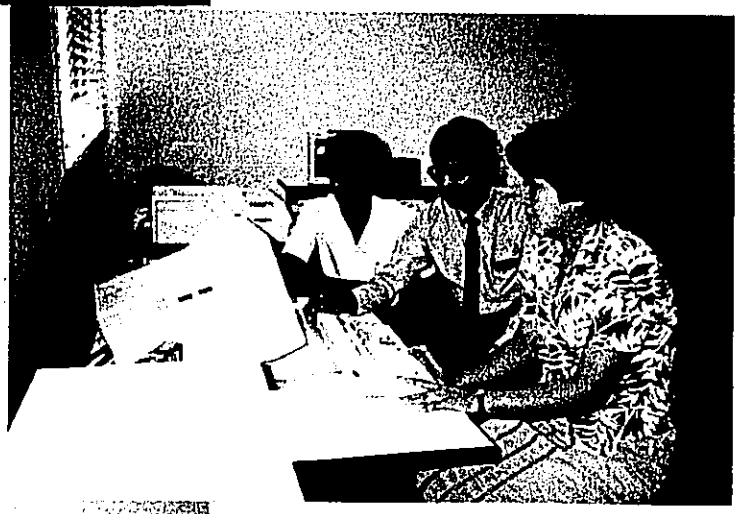
ウィルス学研究室と
カウンターパート

細菌学研究室と
カウンターパート

病理学研究室と
カウンターパート



寄生虫学研究室と
カウンターパート



疫学研究室と
カウンターパート

ＳＰＦ鶏舎と
カウンターパート

合同委員会

―― 目　　次 ――

第１章　巡回指導調査団の派遣

１－１　調査団派遣の経緯と目的

(1) プロジェクトの目的

家禽病（主に鶏病）の研究水準の向上を図り，アセアン諸国の家畜衛生技術者の訓練を通じ，その研究成果，開発された技術を普及し，家禽病研究，防疫の人材開発に貢献するため，以下の事業を行う。

(1) 家禽病（伝染性疾患，寄生虫病中心）の研究活動

(2) アセアン各国の研究者・技術者を対象とする研修・訓練

（第三国研修による）

(2) プロジェクトの経緯

アセアン諸国の養鶏は，優良外来種の導入，安価な飼料の普及などにより，近年規模の拡大が目覚ましい。しかしながら，伝染性疾病の発生とそれに対する予防，治療及び飼養管理の不備などに起因する多大な損失が家禽産業全体に生じている。

このような背景のもとに，1982年における日本・アセアン・フォーラムの場において，アセアン諸国共通の課題である家禽病の研究・訓練に対し，我国の協力が要請された。これに応え我国は，1984年11月，コンタクト調査団を派遣し，要請内容の確認を行った。1985年２月には，ブルネイで開催されたアセアン食糧農業委員会（ＣＯＦＡＦ）畜産部会（ＣＧＬ）の席上にて，マレイシアをホスト国とするアセアン・プロジェクトとして本件の協力計画を位置付けることが再確認された。同年５月，マレイシア政府より「アセアン家禽病研究・訓練センター」の設立に必要な協力を求める公式要請が提出された。

同年７月，プロジェクト方式技術協力及び無償資金協力に係る事前調査団がマレイシアに派遣され，第三国研修を含めた協力計画の基本的枠組について，マレイシア政府関係者との協議が行われた。また，同調査団の報告に基づいて，長期調査員２名が同年10月から１ヵ月半アセアン諸国に派遣された。11月には無償資金協力に係る基本設計調査団及び第三国研修計画に係る事前調査団がマレイシアに派遣された。1986年４月，これらの調査・協議結果に基づき，プロジェクト方式技術協力の実施協議調査

団が派遣され，マレイシア及びアセアン側関係者と協議を行い，同月17日，調査団長とマレイシア国農業省次官との間でR／D（討議議事録），同団長と獣医局次長との間でＴＩＰ（暫定実施計画）の署名が交わされた。

協力の拠点となるアセアン家禽病研究訓練センターの建設については，無償資金協力により，1988年1月に第1期工事（研究棟・宿舎の建設及び電子顕微鏡などの機材設置）が竣工し，第2期工事（ＳＰＦ鶏舎及び実験鶏舎の建設）は同年7月に竣工した。

平成元年2月から3月にかけて派遣された昭和63年度巡回指導調査団の行った中間評価の結果，家禽病の鑑定及び研究に必要な基礎技術が殆どセンターに紹介され，機材については特殊な研究用及び研修用の一部を除いて殆ど整備されたと判断された。但し，具体的な研究成果が上がっていない点，ＳＰＦ鶏の衛生状態をモニターするための技術の標準化と習得が必要であること，特殊な設備・機材の保守管理体制の整備の必要性，センター所員配置の充実の必要性及びアセアン・センターとしての活動の活性化が必要であることなどを調査団が提言し，合同委員会でマ側はこれらの提言を受入れ，日マ相方が必要な措置を取ることで合意した。

(3) 調査団派遣の目的

プロジェクト開始（R／D署名）後約4年を経過した現在，昨年度の調査団（中間評価）以降のプロジェクト進捗状況を調査し，運営・管理及び技術上の問題点について助言・指導をし，残された協力期間（1991年4月16日まで，約1年余り）のプロジェクト活動・投入計画等について協議することを本調査団派遣の主目的とする。加えて，アセアン側が本プロジェクトについて協力期間の延長を要請する旨合意したとの情報があることから，延長要請に係るより具体的な内容，現R／D期間終了後のマ側のプロジェクト運営計画，その他の関連事項について調査することも目的として，本調査団が派遣された。

1－2　調査団の構成

担当業務	氏　名	所属先
(1) 総括兼鶏病研究（団長）	國安　主税	農林水産省家畜衛生試験場

		研究第一部長
(2) ＳＰＦ・実験鶏舎管理	湯浅　裏	農林水産省
		家畜衛生試験場
		総合診断研究部
		病原診断研究室長
(3) 寄生虫学	藤崎　幸蔵	農林水産省
		家畜衛生試験場
		研究第一部
		原虫研究室長
(4) 業務調整	草野　孝久	国際協力事業団
		農業開発協力部
		畜産開発課

1－3　調査日程表

日順	月　日	曜	行　　程	調　査　内　容
1	1／15	月	東京 ⟶ｸｱﾗ・ﾙﾝﾌﾟｰﾙ	往　路 プロジェクト調整員との打合せ
2	16	火	クアラ・ルンプール	ＪＩＣＡ事務所との打合せ 日本大使館表敬 獣医局長表敬，幹部との打合せ
3	17	水	〃 ｸｱﾗ・ﾙﾝﾌﾟｰﾙ⟶イポー	獣医局幹部との協議 移　動
4	18	木	イポー	アセアン家禽病研究訓練センター調査 専門家チームとの打合せ 施設視察 病理学研究室との協議 寄生虫学研究室との協議 細菌学研究室との協議 獣医学研究所幹部との懇親会
5	19	金	イポー	ＳＰＦ鶏舎担当者との協議 ウィルス学研究室との協議 疫学研究室との協議 センター職員との懇親会
6	20	土	〃	プロジェクト作業部会会議出席 資料整理

日順	月　日	曜	行　　程	調　査　内　容
7	1／21	日	イポー	資料整理 合同委員会用調査団コメント作成
8	22	月	イポー→クアラ・ルンプール	移　動 獣医局プロジェクト運営委員会会議出席
9	23	火	クアラ・ルンプール	合同委員会会議出席
10	24	水	〃	(1)　合同委員会会議議事録作成 (2)　マレイシア 農業開発研究所畜産部門視察 マレイシア農科大学獣医学部視察 獣医局公衆衛生ラボ及び病性鑑定所視察
11	25	木	〃	(1)　合同委員会会議議事録作成 (2)　獣医局バトゥ・アラン農場視察 (1)(2)　合同委員会会議議事録署名式
12	26	金	〃	国立農業公園視察 ケンタッキー・フライド・チキン鶏肉処理場視察
13	27	土	クアラ・ルンプール →東京	復　　路

＊(1) 國安団長，草野隊員
(2) 湯浅・藤崎団員

1－4　主要面談者

◎ マレイシア農業省 (Ministry of Agriculture)

Mr. A. T. Nathan	事務次官代理
Mr. A. Tambi Ghaffar	国際課長補佐

獣　医　局 (Department of Veterinary Services)

Datuk Dr. Mustaffa bin Hj. Babjee	局　　長
Dato' (Dr.) Hj. Kardin	局　次　長（衛生担当）
Dr. Nik Muhamad	局　次　長（畜産担当）
Dr. Hadi bin Dato Hashim	局長補佐（衛生担当）
Mr. Yahya Muhamad	国際室長

獣医学研究所 (Veterinary Research Institute)

Dr. Anwar Hassan	所　　長
Mr. R. Christopher	寄生虫学研究室長
Mr. Lo Honn Seang	生物製剤研究室長

アセアン家禽病研究訓練センター

（ＡＳＥＡＮ Poultry Disease Research and Training Centre）

Dr. Gan Chee Hiong	所　　長
Mr. Lim Kean Teik	ウィルス学研究官
Dr. Wan Mohd. Kamil b. Wan Nik	ウィルス学研究官
Ms. Tan Choong Lian	疫学助手
Dr. Mahani bt. Abd. Hamid	病理学研究官
Dr. Rahmat bin S. M. Sheriff	寄生虫学研究官
Ms. Zaini bt. Mohd. Zain	細菌学研究官
Mr. Yap Hon Choong	電子顕微鏡担当技官
Mr. Lip Kim Lock	ＳＰＦ鶏舎担当畜産助手

◎ マレイシア総理府（Prime Minister's Department）

経済企画局（Economic Planning Unit）

Mrs. Wan Norma Wan Daud	国際協力担当事務官

◎ マレイシア外務省（Ministry of Foreign Affairs）

アセアン事務局（ＡＳＥＡＮ－Malaysia Secretariat）

Mr. Othman Harun	担当事務官

◎ 在マレイシア日本大使館

小池寛治	公　　使
赤木利行	二等書記官

◎ ＪＩＣＡマレイシア事務所

岡部和男	所　　長
湊　芳郎	次　　長
山下良恵	所　　員（担当）

◎ アセアン家禽病研究訓練計画・日本人専門家チーム

向井一朗	業務調整員
池田澄男	ウィルス学専門家（長期）
大田博明	ウィルス学専門家（長期）

第２章　要　　約

２－１　技術移転と研究活動

本プロジェクト開始以来４年の間に，マレイシアへの日本側専門家の派遣及びカウンターパートの日本における研修あるいは機材の供与によって，各部門毎にきわめて多くの技術移転がなされてきた。研究所としての基礎を造るために，ある程度の基礎技術の移転は必要とされるが，技術は日進月歩の改良開発がなされ，また，本来，技術は研究進行の過程で習得・導入されるものとの考えから今後のマレイシア側の方向を質した。

マレイシア獣医局幹部は上記の考えを全面的に支持し，今後は「新しいものを創造する」研究のありかたを指導して欲しいとの要望があった。

一方，ＶＲＩ／ＡＰＤＲＴＣ幹部及び所員の一部には，先進国である日本から新しい技術を導入し，普及することこそ研究であると強く主張するものもあった。

２－２　各研究分野の運営

研究官が海外へ留学中の疫学研究室を除いて，遅いながらも研究体制を着実に整えつつある，しかし，ウィルス学研究室では研究官が民間へ転出し，これまでの日本側専門家及び日本での研修の成果が継承されていないように感じられた。これらは，この研究室が担当しているウィルス株の保存の不備，実験鶏舎運営の不備，ＳＰＦ鶏モニタリングあるいは研究課題設定上のトラブルに現れている。細菌学研究室での成果は着実に挙がっている。しかし，研究官が病弱なため業務の継続が困難な場合があるようである。寄生虫学研究室と病理学研究室には，これまでに多くの技術移転がなされたが，本年は両研究室の研究官とも日本で長期研修を受けていたため，特筆すべき成果は挙がっていない。疫学研究室を含めて，日本側専門家が不在で，マレイシア側研究官も海外で研修を受けているような場合の，研究補助等の業務管理は今後の課題であろう。

２－３　各種機器の供与要請

各研究分野から様々な機器類の供与要請が出された。しかし，これらの中には各研究分野で共通に使用できるもの，すでに導入されているもの等があり，管理維持のための光熱水量・電気量などが増加することなどを考慮し再検討するよう示唆し，了承された。

また，日本から導入された新技術を普及するという名目のもとに酵素抗体法（ＥＬＩ

ＳＡ）測定機器をアセアン諸国およびマレイシア国内に購入配布するよう要請があった。しかし，本技術は基礎研究での応用は別として，鶏病の野外診断に利用するには検討すべき多くの問題点を残しており，日本でも，欧米でも検討の段階である。したがって，機器の配布については時期尚早である旨を指摘した。

２－４　プロジェクトの延長問題

マレイシア側の獣医局幹部，ＶＲＩ，ＡＰＤＲＴＣ幹部，及び所員からグループ毎に協力期間終了後の対応について意見を聴取した。ほとんど全員がプロジェクトの延長を希望し，次のような延長希望の理由を上げている。

１）プロジェクト開始１～２年目までは研究室もなく，器具機材も人材も不足していた。

２）２年目でようやく形態は整ったが，開所式等の準備に追われ，業務は停滞した。

３）したがって，本格的な研究所としての活動はこれからであり，基礎技術もなお不足しており，「新しいものを創造する」研究者としての訓練もこれからである。

調査団としてはこれらの意見に基本的には同意できるが，その決定は評価調査団に委ねられると答えた。

第３章　プロジェクト実施状況

３－１　プロジェクトの進捗状況

(1) 家禽疾病に関する研究活動

1) 家禽疾病の病因学的研究

・ウィルス性疾患

ウィルス部門では，研究官の退職にともない，新研究官が６月に配属された。そのため，本年度は主として，新任研究官に対する基礎的技術の移転が専門家により実施された。また，研究活動としては，ニューカッスル病の不活化ワクチンの開発，ガンボロ病ウィルスに関する研究が行われた。いずれも興味深い研究テーマではあるが，既存知識の収集等今後は新しい知見の得られる研究計画の立案が必要であろう。これまでに移転されてきた技術が，人事異動などで研究室内で十分に伝達されていないとすると問題である。

・細菌性疾患

伝染性コリーザに関する研究が前年度の継続として進められている。H. paragallinarum　A型菌および H. avium のマレイシアでの最初の分離に成功した。また，伝染性コリーザ予防液の効力試験を実施中である。

９月に派遣された日本側専門家によりマイコプラズマ菌を中心とする技術移転が行われ，それをもとに，M. synoviae がマレイシアで初めて分離された。

今後は移転されたこれらの技術をもとに，新しい研究課題を設定する必要がある。

・寄生虫・原虫性疾患

寄生虫部門では，研究官が日本において６ヵ月の研修をうけ，コクシジウム，ロイコチトゾーン原虫の培養，免疫化学的分析，薬剤感受性試験などの技術移転を受けた。この期間および研修終了後においても，ニワトリヌカカ卵の室内継代飼育を確立するための多くの努力がなされたが，未だ，成功していない。近々日本からヌカカ卵を導入し，マレイシア側技術の確認を計画している。このため，ロイコチトゾーン病の研究は一時中断し，コクシジウム病，とくにE. maxima を中心とした研究を進めるよう進言した。

2）家禽病の診断法の開発と応用

・ウィルス学研究室

主として，抗体検出のための酵素標識免疫測定法（ＥＬＩＳＡ）の開発・応用に関し，専門家による技術移転が行われてきた。いくつかのウィルスについては，方法も確立され，更に開発中のものもあることが報告された。しかし，ＥＬＩＳＡは感度も高く，有用な方法であるが，抗原の調製法，非特異反応の除去，技術の標準化など多くの問題点も残されており，野外での応用にあたっては，今後さらにデータの集積が必要と考えられる。

・細菌学研究室

これまで行われてきた伝染性コリーザの血球凝集反応のほかに，９月から派遣された専門家によりマイコプラズマの赤血球凝集抑制反応，酵素標識免疫測定法（ＥＬＩＳＡ）および最新の技術として Dot-immunoblot technique (DIT) が移転された。しかし，これらの技術を野外に応用するまでには，抗原の大量培養法，術式の標準化など，なお多くの検討すべき問題が残されている。

・寄生虫学研究室

主にロイコチトゾーン抗体検出のための寒天ゲル内沈降反応が実施された。しかし，先にも述べたごとく，ニワトリヌカカの研究室内飼育に成功していないため，ロイコチトゾーン原虫の実験感染による増殖による抗原の調製ができずにいる。

日本での研修により，コクシジウム症の診断法としてＥＬＩＳＡ技術の移転が行われたが，マレイシアで実際に応用されるまでには至っていない。

・病理学研究室

本研究室の研究官は日本で研修を受けていたために本年度前半は不在であった。10月から派遣された専門家により電子顕微鏡による病理学的解析についての技術移転がなされた。また，アヒル肝炎ウィルスのアヒル発育卵に対する接種試験を実施し，immunoperoxidase法などの新技術によりウィルス抗原の電子顕微鏡下での所在を明らかにすることができた。次年度も電子顕微鏡，モノクローン抗体，immunoperoxidaseなどの課題が設定されていたが，病理学の基本である一般病理組織学的技術との対比で研究を進めるよう示唆した。

3）家禽用ワクチンの開発

ウィルス学研究室ではニューカッスル病不活化ワクチンを，また，細菌学研究室では伝染性コリーザ不活化ワクチンの効力試験を実施している。しかし，これらは何れも市販の製品について行われており，研究室独自の開発研究はまだ行われていない。

ニューカッスル病にしろ伝染性コリーザにしろ，マレイシアにおけるこれら疾病の発生状況を十分に把握したうえで，それに対応できるワクチンの使用法を確立すべきことを示唆した。

4）家禽病の疫学調査

・ウィルス性疾患

ウィルス性疾患の野外調査は前年度までに数回実施されており，本年は実施されていない。

・細菌性疾患

9月から派遣された専門家により，Sitiawanおよび Ipoh におけるブロイラー養鶏場3ヶ所及び産卵養鶏場2ヶ所についてマイコプラズマの汚染調査が行われた。ブロイラー養鶏場は血清反応では M. gallisepticum も M. synoviaeも陰性であったが，1例から M. gallisepticum, M. synoviae以外のマイコプラズマが分離された。産卵養鶏場では M. gallisepticum およびM. synoviae の両菌種が分離され，両菌種に対する抗体も検出された。

・寄生虫・原虫性疾患

特に課題として調査は実施しなかったが，コクシジウム流行株の収集が行われた。

5）ＳＰＦ鶏飼養技術の確立

1988年9月に日本から 400個のＳＰＦ卵が導入され，第1代のＳＰＦ種鶏生産が開始された。ヒナは順調に成育し，選抜により，♀68羽，♂20羽のＳＰＦ卵生産鶏群が構成された。その後，週2回の人工授精により，ＳＰＦ卵が生産された。1989年2月の産卵開始から12月までの総産卵数は11,545個であった。同年9月に開始された第2代目のＳＰＦ鶏生産も第1代目同様順調に経過し，1990年3月頃からＳＰＦ卵の供給が可能となる。第1世代ＳＰＦ鶏に対する病気のモニタリングは，19種の疾病について実施されたが，いずれも陰性であることが証明された。今年度は，一部の病原体について，確認のため日本で検査されたが，現在は鶏白

血病をのぞいて，センターでの検査が可能となった。

一方，1989年度生産されたＳＰＦ卵の実験室への供給率は，産卵数に対して月毎に14～100 %（平均58%）であった。ＳＰＦ卵の使用率は全体として高くはないが，今後，研究業務が本格的に行われるようになると，使用率も増加するものと考えられる。ＳＰＦ鶏の飼養・管理技術は短期間の専門家の指導にもかかわらず，良好に習得されており，プロジェクトの中ではもっとも良く進行している部門と考えられる。

6）実験鶏舎の運営

実験鶏舎では，電気系統が繰り返し故障した。また，アイソレーター，床面，空気のリークなどの修理が行われ，この期間十分に稼働しなかった。そのために，細菌研究室で実施中の伝染性コリーザ予防液の効力試験に使用中のヒナが死亡し，研究を中断せざるを得なかった。その他，伝染性気管支炎の研究にも利用された。6月から12月までの利用時間は月に50～80時間であった。今後はいくつかの実験が計画されており，利用率も増加するものと思われる。

(2) アセアン諸国向け家禽病訓練

本年度は1990年1～3月にセミナーとして細菌学および寄生虫学の2分野，また特殊診断コースとしてウィルス学，細菌学，寄生虫学および病理学の4分野が予定されている。

1）セミナー

細菌学分野では「細菌の病原性と遺伝子」（仮題）のテーマで内田郁夫技官（農水省家畜衛生試験場研究第一部細菌学第二研究室）にサルモネラ，大腸菌など家禽病に関連する細菌類の病原性がどのような遺伝子によって支配されているか，その検索方法など最新の知見をもとに解説をお願いしてある。

寄生虫学分野では「鶏ロイコチトゾーン病に関する最近の研究」（仮題）のテーマのもとに森井勤助教授（杏林大学医学部寄生虫学教室）の鶏ロイコチトゾーン病の現況，研究の方法論などについての解説が予定されている。

2）特殊診断コース

・ウィルス学

研修項目として，1）組織培養法と培養基調製法，2）ウィルス増殖法，3）

ゲル内沈降反応用抗原調製法，4）酵素抗体法用抗原の調製と反応，5）抗体および抗原の力価測定法，6）抗体の精製と濃縮法，7）電気泳動法　等が予定されている。日本側専門家との協力のもとに，これらを実施することには問題はないと思われる。

・細　菌　学

研修項目として，マイコプラズマを中心に，1）培養基の調製法，2）分離，同定法，3）血清診断用抗原の調製法，4）各種血清反応　等が予定されている。担当の細菌学研究室の研究官が病弱で，準備等への支障が懸念される。

・寄 生 虫 学

コクシジウムの分離，分類法についての研修が予定されている。とくに問題となることはないと考えられる。

・病　理　学

家禽病病理組織の調製法，観察法についての研修が予定されている。特に問題となる点はないと考えられる。

3－2　問 題 と 対 策

研究分野の運営の面では，1）主任研究者が海外で研修中の研究室業務運営，2）日本側専門家の不在な分野での業務運営，3）日本人専門家チーム・リーダーの不在，等が問題となった。とくに，リーダーの不在は1），2）の問題でマレイシア側と協議するときには日本側調整員の大変苦労するところであった。

3－3　供与機材の利用

・各 研 究 室

ウィルス，細菌，寄生虫，および病理の各研究室に供与された機材はそれぞれの分野で十分に活用され，それらの保守についても特に問題はないと思われる。新規購入希望機材については，すでに他の分野で保有しているものもあり，有効に共同利用するよう示唆した。

・ＳＰＦ鶏舎

ＳＰＦ鶏舎の予備の冷却機が故障し，一度修理したが，再度故障して現在に至っている。これは早急に修理が望まれる。ＳＰＦ鶏舎の管理運営は順調に行われ，ＳＰＦ

卵供給の役割を十分に果たしている。

・実験鶏舎

電気系統など，いくつかの部分的故障や修理個所があったため，年間をとおして十分に利用されなかった。すでにこれらの問題点は改善されたので，今後は十分活用されるものと思われる。

第4章　指導内容

4－1　日本側のとるべき対応策

現在日本側の専門家としてはウィルス部門に2名派遣されているだけであるが，(1) これからは単なる技術移転ではなく，「新しいものを創造する」研究の手法について指導すること，(2) 先任専門家の残したウィルス株の整理保存を行うこと，(3) ＥＬＩＳＡのような検討すべき事項の多い技術の成果を発表するときには十分慎重に行うこと，(4) 日本側専門家同士および日本側とマレイシア・カウンターパートとの間の意志の疎通を十分にとること，を申し入れた。

4－2　マレイシア側のとるべき対応策

マレイシア側に対しては，(1) あらかじめ提出された20課題の研究テーマについて，これまでの技術移転との関連等から設定が適当であるかどうかを指導した。(2) 技術移転と「新しいものを創造する」研究の考え方の相違を示した。(3) 研究成果の取り纏め方について系統的に説明指導した。今後，これらに基づいて研究を進展させるよう指導した。

4－3　次年度の活動計画

(1) 家禽病に関する研究活動

1) 家禽疾病の病因学的研究

・ウィルス性疾病

来年度の課題として13課題を設定していたが，それらの中から7課題を選定した。これらはいずれも技術開発あるいは技術取得に関するもので，実施には困難はないものと思われる。しかし，何か新しい知見の得られるような，将来にわたる研究計画の立案も今後必要と考えられる。

1990～1991年の課題は以下の7題である。

ⅰ．鶏白血病ウィルス中和抗体の検出法

ⅱ．13種ウィルスに対する第2代ＳＰＦ鶏群のモニタリング

ⅲ．モノクローン抗体の調製法

ⅳ．ニューカッスル病ウィルスおよび鶏脳脊髄炎ウィルスの血球凝集反応お

よびゲル内沈降反応に対する界面活性剤の影響

v．鶏脳脊髄炎のゲル内沈降反応の開発

vi．間接免疫ペルオキシダーゼ（ＩＩＰ）反応の開発

vii．鶏ＩｇＧの濃縮と精製

・細菌性疾病

次年度以降の計画としてモノクローン抗体，ＤＮＡ操作などの課題が予定されていたが，ヘモフィルス菌とマイコプラズマ菌を中心に分離，病原性，薬剤感受性などの基礎研究を継続し，上記技術は研究の進行の過程で必要になった時点で導入するよう示唆した。

この分野の次年度以降の課題は下記のとおりである。

ｉ．伝染性コリーザ

ａ）病原因子

ｂ）免疫応答

ｃ）モノクローン抗体

ii．マイコプラズマ感染症

ａ）病原性と発症要因

ｂ）免疫応答

ｃ）予防法の確立

ｄ）モノクローン抗体

ｅ）病理因子

・寄生虫性疾病

ロイコチトゾーン病の研究体制が整うまではコクシジウム，とくに Eimeria maximaに関する研究を行うよう進言した。次年度以降の課題は以下の通りである。

ｉ．コクシジウム病

ａ）野外発生調査

ｂ）マレイシアで分離された E. maxima株の性状検査

ｃ）薬剤感受性試験

ｄ）免疫学的研究

ii．ロイコチトゾーン病

ａ）ニワトリヌカカの培養と維持

第５章　合同委員会の協議事項

５－１　経　　緯

調査団が首都クアラ・ルンプールに到着した翌日（１月17日）から２日間に亘り，獣医局本部にて局長等幹部に調査概要の説明，マレイシア側の意見聴取を行った。

３月18日からセンター現場にて，各研究室ごとに進捗状況の報告，現状視察，協議を行った後，これらに対する調査団のコメントをまとめ，３月20日の Working Group（作業部会）会議にて協議した。

それまでの調査結果を踏まえ，調査団のコメントを合同委員会用に作成し，３月22日，内容について再び獣医局幹部と協議した上で，３月22日の合同委員会にて調査団のコメントを述べた。

議事録の日本側署名者は，専門家チーム・リーダーが不在のため，調査団長が代表で，プロジェクトの調整員が立会人として行った。

合同委員会議事録原文は，資料として本報告書に別添したとおりである。

以下に議事録の主要部分を抜粋し，以下に要訳する。タイトル後の（　）内の番号は，議事録原文の番号である。

５－２　プロジェクトの進捗（4）

プロジェクト・マネージャーである獣医学研究所長は，プロジェクトの進捗は全体的に見て，満足の行くものであるとの考えを示した。特に，センターの人員配置状況を考えれば，人材を最大限に活用していると思う。但し，人事についてはセンターの権限の及ばないところではあるが，センタースタッフの数及び質が必要なだけ満たされるべきであるとの考えを述べた。

調査団は，今回の調査の結果，技術協力を促進するに必要な友好的かつ熱意のある雰囲気がセンターのどの部門でも強化されたとの印象を述べた。調査団は，協力開始当初の遅れにも関わらずプロジェクトは成果を見せ始めた，と報告した。

調査団の見解によれば，家禽病の診断及び研究に必要な技術はセンターに対しほぼ充分なほど紹介された。従って，この技術協力プロジェクトの目的の一つである経済的に重要な家禽病の試験研究レベルの向上は部分的には達成している。

調査団はしかしながら，そうした移転された技術を研究に活用できるようになるには，

更に指導を受けながら経験を積む必要があることを強調した。研究活動については，限られた分野で幾らかの進捗が見られる。しかし，ほとんどの部門で，研究計画作成，実験手法，試験結果の分析の方法などの改善が必要である旨提言された。意義のある研究というものは，何らかの新しい発見を持たらし，公共の利益に寄与すべきものである。このような研究を計画し実施して行けるようにセンターの人材が育つためには，更に指導または協力を受ける必要がある旨，調査団の感想を表明した。

センターは，その研究成果や技術を他のアセアン諸国に対し，訓練を通じて普及し，従って，アセアン諸国に於ける家禽病の試験研究に携わる人材の開発に，寄与せんがために建設された。センターで確立された技術については，セミナーや診断コースを通じて他のアセアン諸国に普及されている。しかしながら，センターがアセアン・センターとしての役割を効果的に果たせるようになるまでに発展するには，あと数年かかるであろうというのが調査団の見解であった。

合同委員会は，プロジェクトが満足の行く進歩を遂げているとの認識を持ち，かつ，今後のセンターの発展のためには人材の開発に力を入れるべきであることに合意した。

5－3　日本人専門家派遣要請（5.2）

マレイシア側は次の4名の日本人専門家の派遣を要請した。

長期専門家

1　ウィルス学研究者

1　病理学研究者

1　細菌学研究者

短期専門家

1　寄生虫学研究者

獣医学研究所長は，長期専門家の派遣が困難な場合は短期専門家で，その分野を補充して欲しい旨日本側に求めた。

調査団はマ側の要請について以下のようにコメントした。

ウィルス学分野

3つの研究課題の指導と新しく配属になった研究官の指導とを含め1名の長期専門家の派遣が必要とされるであろうと思われる。

病理学分野

電顕利用と組織病理学を含めた家禽病理学確立を監督し，必要な実験技術を移転するためには，1名の長期専門家の派遣が必要とされるであろうと思われる。

細　菌　学

研究活動を指導するために，1名の長期専門家の派遣が必要とされるであろうと思われる。

寄　生　虫　学

ヌカカの培養方法を確立するためには，1名の短期専門家の派遣が必要とされるであろうと思われる。

鶏アイソレーター操作

実験鶏舎のアイソレーターの正しい操作方法を更に訓練するために，何らかの実験が実際に行われるような時期に1名の短期専門家（技術者）の派遣が必要とされると思われる。

調査団は，長期専門家の派遣が困難になった場合に備え，短期専門家枠を幾つか残して欲しいとの獣医学研究所長の申し出に同意した。

鶏アイソレーターの操作についての専門家派遣の提言に関して，獣医学研究所長は，そのような専門家が必要かどうかの判断は，今後の試運転を行った結果にかかっている旨表明した。

委員会は，これら日本人専門家派遣要請が，調査団によって日本側の関係機関に伝えられることを確認した。

5－4　カウンターパートの日本研修受け入れ要請（5.3）

獣医学研究所長は，ウィルス学，細菌学，病理学及び疫学の各分野のスタッフ計4名の日本研修を要請した。

獣医局本部から，プロジェクトの運営に関わる幹部1名の視察研修受け入れの要望が出された。

調査団は，これらの要請について次のような見解を表明した。

ウィルス学

新しく配属された研究官は，暫く日本人専門家の指導を受けた後，日本での研修を受けることを勧める

病　理　学

研究助手に組織病理学の研修を受けさせることは，日本での研修課題が明確になるまで待つべきと思われる。

細　菌　学

研究助手をマイコプラズマに関する実験技術の研修に送っても良いであろう。しかしながら，助手の追加配属が無い限り，彼女の欠員は計画されている研究活動の遅延の原因となる恐れがある。

疫　　学

助手を，野外調査とデータ収集手法についての研修に派遣しても良いであろう。

総理府経済企画庁の代表者が，獣医局幹部の日本視察の目的について説明を求めた。獣医局は，マレイシアの行政官がセンターの将来計画を練る上で，日本の最新の研究開発を視察することが有益との説明を行った。調査団は，そのような視察がセンターにとって有益となるであろうとの意見を述べた。

委員会は，これら5分野での研修受け入れ要請について，調査団が日本の関係機関に伝える旨確認した。

5－5　機材供与への要請（5.4）

各研究室からの機材供与の要望は別添資料Dの関係部所に詳しく記入されている。これら機材のリストに関して，マレイシア側は優先度や運転コストなどを更に検討する旨述べた。

合同委員会は，センターが各機材の必要性を再検討の上，最終リストを日本側へ提出することを確認した。

5－6　現行協力期間終了後の計画（6）

議長は，マレイシア側より現在のプロジェクト協力期間終了後の計画についての提示を求めた。

獣医局の国際室長が以下のように報告した。

1989年2月27日及び28日にセンターで開催されたアセアン畜産・獣医局長会議の提言に基づき，1989年7月27日及び28日にタイ国バンコックにて開かれたアセアン農業食糧委員会（ＣＯＦＡＦ）畜産部会（ＬＧＬ）第12回会議では，本プロジェクトの延長を要請することが決議された。この延長要請については，引き続き1989年8月22日から25日

のアセアンＣＯＦＡＦ第19回会議及び1989年９月22日のアセアン常任委員会において追認された。従って，アセアンは，1990年10月に予定されている次期のアセアン－日本フォラムにおいて，延長要請を正式に提出するであろう。

マ側は，アセアンが延長プロジェクトの目的としては，以下の点を上げていることを報告した。

（ｉ）センター施設を利用してのアセアンの共同研究と，より直接的な関わりを通してアセアン諸国の研究レベルを向上すること。

（ii）アセアンのメンバー諸国にとって，適切な研究訓練活動となるよう改善すること。

（iii）センターでの訓練成果を自国で実施するために必要な研究資機材をアセアン諸国に供与すること。

（iv）鶏病に関する科学誌やセンターのニュースレターの刊行により，研究成果や情報を伝達または交換することを強化すること。

マレイシア側の説明に対し，調査団は，この合同委員会では現行Ｒ／Ｄ内容に基づく協力期間の延長については協議することはできても，発表されたようなアセアンとしての目的を持った形での延長については権限外の筈であることを確かめた。これについて，アセアンからの要請については，アセアン－日本フォラムにおいて協議すべきものである旨，委員会は確認した。調査団は更に，説明されたようなアセアン全体としての目的を持ったプロジェクトは現行の二国間協力プロジェクトとは別個のもの，または第Ⅱフェーズと考えるべきではないかとの見解を付け加えた。

マレイシア側は，期間は1990年後半に行われる最終合同評価の結果にもよるが，1986年４月17日に署名された現行Ｒ／Ｄの内容と目的のまま，最大限５年間の二国間技術協力延長を要請したいとの意向を表明した。

マレイシア側は，センターの研究・訓練及びレファレンス機関としてのセンターの機能を国際的に認められる水準に達するためには，更に人材育成を行う必要のあることを強調した。この目標を達成するためには，日本側の協力が更に数年間必要とされることを，マレイシア側は説明した。

これらについて調査団は，延長に対する要望はセンターの全部門及び所長，獣医学研究所長そして獣医局本部の全ての次元で調査団に表明されたと報告した。但し，これらの要望はマレイシアと日本の相方が希望すればという注釈付きであった。

調査団の見解によれば，鶏病の診断と研究を行うに必要なほとんどの技術はセンター

に存在している。これは，「鶏病の試験研究のレベルを向上させる」というこのプロジェクトのひとつの目的は，部分的には成し遂げられているということを示すものである。しかしながら，センターが，より有効的な研究を実施し，真のアセアン・センターとしての役割を果たすようになるまで人材教育を行うには，あと数年かかるであろう。

調査団は，このような技術協力プロジェクトは，その成果と効果が協力受益機関にて維持されると認められるまで続けられるべきであるとの見解を述べた。

経済企画庁からの代表は，経験から言って，日本との協力プロジェクトの延長に際しては，どの部分での延長が必要になるのかによって延長の形態も変わると述べた。これに関し，彼女は延長要請の詳細内容について説明を求めた。

それに応えて，重要なのはカウンターパートの日本研修と日本人専門家の派遣である旨説明された。獣医学研究所長は，更に，機材供与への要望は延長計画においては，優先度が低いとつけ加えた。

延長要請とその詳しい内容については，次年度実施される予定の合同評価の際，協議されるであろう旨調査団より述べられた。

議長より，調査団がマレイシア側の延長要請について認識し，これを日本側の関係機関に伝えてくれるよう求めた。調査団はこれに対し，マレイシア側の延長要請について記録し，日本側関係機関に伝える旨合意した。

5－7　調査団よりの提言（7）

調査団は，今後のプロジェクト活動を改善するために，下記のとおり幾つかの提言を行った。

（i）センターの人員配置については，昨年度の調査団の提言に基づき幾つかの部門で改善されている。本調査団は，今後の発展のために以下のスタッフを増員すべきと考える。

(a) 細菌学研究官及び助手

(b) 組織病理学研究官及び助手

(c) 寄生虫学研究官及び助手

(d) 機械・電気施設保守技師

(e) 出版担当

（ii）第三国研修計画によるアセアン家禽病セミナー及び診断技術コースは，1回に1

つの分野に集中した形で行うほうが，より良い計画が立てられるのではないかと思われる。

（iii）センター情報の出版作業は可能な限り，早期に開始すべきである。

（iv）ＳＰＦ鶏舎の空冷装置は早急に修理すべきである。

（v）日本人専門家派遣，カウンターパート研修受け入れ，機械供与などの要請書は，日本の会計年度に公式な手段を通じて提出されるべきである。これは第三国研修計画案についても同様である。

これらの調査団の提言に対し，獣医学研究所長は全てについて合意した。センターのスタッフ増員については，獣医局は第６次マレイシア・プラン（1991～95年経済計画）のなかで，研究官と助手を含め13名の増員を要求した旨付け加えられた。

第６章　協力期間終了後に対する所見

前章５－６（６）：１９頁で述べたとおり，アセアン全体としての要望は，現行Ｒ／Ｄの内容をかなり逸脱し，別個のプロジェクトまたは第Ⅱフェーズとして位置付けた方が良い内容であった。見方を変えれば，アセアン・メンバー各国への機材供与を除けば，現行の第三国研修計画の内容変更及び新たにＣ／Ｐ個別第三国研修計画などを実施することにより，ある程度は要望に応えられるものと思われる。しかしながら，アセアン諸国が直接運営に参画し，更に多くの直接的受益が各国に持たらされるようなアセアン・センターとしての役割を果たすべき活動は，現行のＲ／Ｄに記されているプロジェクトの目的を越えていると思われる。

現行Ｒ／Ｄによるプロジェクトのゴールは，センター（マレイシア側）が独自に意義のある家禽病研究を行えるまでに水準が向上し，マレイシア人研究官等の手により，アセアン諸国の家禽病研究・診断業務に係る研究者や技術者の訓練が運営できるようになることであり，その後のセンターの発展については本来マレイシアと他のアセアン諸国との間で進められるべきものであろう。但し，ここまで成長してきたセンターを真の国際研究機関に育てるため，引き続き何らかの形で我国の協力が行われることは望ましい。

こうした長期的なセンターの将来を論ずることも必要ではあるが，今回の調査の目的は現行Ｒ／Ｄの協力期間が終了１年を残すのみとなったため，その直後の協力のあり方についてマレイシアおよびアセアン側の意向を打診することにあった。

大学に例えれば，これまでの技術移転は学部のカリキュラムを終えた段階で，これからはマスターコースとして自ずから研究テーマを設定し，論文を発表する方法を伝達する，ということでマレイシア側とも意見の一致を見た。そのためには各研究分野のリーダー的人材の育成に努める必要があると考えられた。

こうした観点から，マレイシア側は現行Ｒ／Ｄのまま協力期間を可能な限り延長したいとの要望であった。延長の主な理由と目的は，人材育成であり，機材は充実してきているので優先度は低い。

調査団の所見としては，この技術協力の成果と効果が，センターにおいて維持され発揮されるようになるには，更に数年を要すると思われた。また，そうなってこそ，このプロジェクトに派遣された専門家，研修員を受け入れ指導した我国内の研究者や技術者，そしてそれを支援し続けてきた人々が報われるのである。14億円近くの無償資金協力に

よる施設に始まり，機材供与，その他専門家派遣や研修員受け入れなどプロジェクトの運営に賞やされた多額の国税も意味あるものとされなければならない。

いずれにしても，今後の計画は次年度の最終評価を待って決定されることになるが，長期的な広い視野を持って判断が下されることが望ましい。

別添資料

第4回合同委員会議事録

（原　　文）

THE MINUTES
OF
THE FOURTH JOINT-COMMITTEE MEETING
FOR
THE ASEAN POULTRY DISEASE RESEARCH AND TRAINING PROJECT

KUALA LUMPUR, MALAYSIA

23 JANUARY, 1990

THE MINUTES OF
THE FOURTH JOINT-COMMITTEE MEETING FOR
THE ASEAN POULTRY DISEASE RESEARCH AND
TRAINING PROJECT

The Fourth Joint-Committee Meeting for the ASEAN Poultry Disease Research and Training Project, under the Technical Cooperation Programme of Japan International Cooperation Agency (JICA), was held on 23 January, 1990 at the Conference Room of the Department of Veterinary Services, Ministry of Agriculture, Kuala Lumpur, Malaysia.

Having reviewed the activities and discussed the progress of the project in its fourth year, the Meeting endorsed the Work Plan for the fifth cooperation year (1990/91). Various suggestions arising from the discussions were accepted and shall be implemented accordingly.

The Meeting took note of the proposals by the Malaysian side for the extension of the present cooperation period.

Matters aroused from the discussions at the Meeting shall be brought to the attention of the respective Governments.

國安主稅

DR. CHIKARA KUNIYASU
Leader
Annual Consultation
Mission for APDRT Project
JICA

DATO' (DR.) HJ. KARDIN BIN HJ. SHUKOR
Deputy Director General
Department of Veterinary Services
Ministry of Agriculture
Malaysia

Witnessed by

向井一朗

MR. ICHIRO MUKAI
Project Coordinator
for APDRT Project
JICA

Witnessed by

MR. ABD. GHAFFAR A. TAMBI
Assistant Secretary
International Unit
Ministry of Agriculture
Malaysia

THE FOURTH JOINT-COMMITTEE MEETING

Date : 23rd Jan. 1990

Time : 2.30 p.m.

Venue : Conference Room
Department of Veterinary Services
Ministry of Agriculture
Block A, Floor 9
Exchange Square
Off Jalan Semantan
Damansara Heights
50630 Kuala Lumpur
Malaysia

ATTENDANCE

1. Chairman

Mr. A.T. Nathan	Deputy Secretary General Ministry of Agriculture Malaysia

2. Members

(i) MALAYSIAN SIDE

Dato' (Dr.) Hj. Kardin Hj. Shukor	Deputy Director General Department of Veterinary Services Ministry of Agriculture Kuala Lumpur, Malaysia
Dr. Hadi Dato Hashim	Assistant Director General (Health) Department of Veterinary Services Ministry of Agriculture Kuala Lumpur, Malaysia
Dr. Abdul Rahman Mohd. Salleh	Assistant Director General (Production) Department of Veterinary Services Ministry of Agriculture Kuala Lumpur, Malaysia

Dr. Anwar Hassan	Director Veterinary Research Institute Department of Veterinary Services Ministry of Agriculture Ipoh, Perak, Malaysia
Dr. Mohd. Nordin Hj. Mohd. Nor	Director of Planning and Evaluation Department of Veterinary Services Ministry of Agriculture Kuala Lumpur, Malaysia
Dr. Gan Chee Hiong	Director ASEAN Poultry Disease Research and Training Centre (APDRTC) Veterinary Research Institute Department of Veterinary Services Ministry of Agriculture Ipoh, Perak, Malaysia
Mrs. Wan Norma Wan Daud	Assistant Director Economic Planning Unit Prime Minister's Department Kuala Lumpur, Malaysia
Mr. Abd. Ghaffar A. Tambi	Assistant Secretary International Unit Ministry of Agriculture Kuala Lumpur, Malaysia

(ii) ASEAN SIDE

Dato' (Dr). Hj. Kardin Hj. Shukor	Member ASEAN-COFAF Coordinating Group on Livestock

(iii) JAPANESE SIDE

Dr. Chikara Kuniyasu	Leader JICA Annual Consultation Mission for APDRT Project
Dr. Noboru Yuasa	Member JICA Annual Consultation Mission for APDRT Project

Dr. Kozo Fujisaki	Member JICA Annual Consultation Mission for APDRT Project
Mr. Takahisa Kusano	Coordinator JICA Annual Consultation Mission for APDRT Project
Mr. Ichiro Mukai	Project Coordinator JICA Expert Team APDRT Project
Dr. Sumio Ikeda	Long-term Virologist JICA Expert Team APDRT Project
Dr. Hiroaki Ota	Long-term Virologist JICA Expert Team APDRT Project
Mrs. Yoshie Yamashita	Assistant Resident Representative JICA Malaysia Office Kuala Lumpur, Malaysia

3. Observers

Mr. Toshiyuki Akagi	Second Secretary Embassy of Japan, Kuala Lumpur, Malaysia
Mr. Othman Harun	Assistant Secretary ASEAN-Malaysia Secretariat Ministry of Foreign Affairs Kuala Lumpur, Malaysia

4. Secretariat

Mr. Yahya Muhamad	Research Officer International Unit Department of Veterinary Services Ministry of Agriculture Kuala Lumpur, Malaysia

MINUTES

1. OPENING

The Chairman opened the Meeting by welcoming the Japanese Annual Consultation Mission (the Mission) headed by Dr. Chikara Kuniyasu. He also acknowledged the attendance of representatives from the Japanese Embassy, Japan International Cooperation Agency (JICA) Malaysia Office and senior officials from the Malaysian side.

In his opening remarks, the Chairman acknowledged the important roles contributed by the Japanese Technical Cooperation Programme in the technology transfer made. He assurred of the Malaysian side commitments to maintain the excellent facilities established by the Grant Aid while he stressed the need to further upgrade the Centre's capabilities as a research, training and reference institution. In order to achieve this aim, the Chairman expressed that Malaysia would require further assistance from Japan for the next few years.

The Leader of the JICA Annual Consultation Mission expressed his sincere gratitudes for the cooperation rendered in accomplishing its assignment and in the hospitalities given. He also mentioned that the Project has started to show positive results.

2. ADOPTION OF AGENDA

The Meeting adopted the agenda which appears as Annex A.

3. REVIEW OF PROJECT

The Director of APDTRC presented to the Meeting a review of the Project, relating to its staffing, research and other activities. The review report is shown as Annex B.

With regard to the staff situation at the Centre, he further elaborated that of the total 45 personnel recommended by the Basic Design Study of the Project, 37 personnel had currently been assigned to the Centre, of which 10 persons are from the Veterinary Research Institute's (VRI) pool staff. He also informed that the request for mechanical/electrical maintenance engineer continued to be pursued with the Malaysian Government due to its critical need for the maintenance of the Centre's sophisticated facilities. He informed that a staff now being trained overseas would also contribute to the long-term benefits on the manpower development of the Centre.

The JICA Coordinator to APDRT Project reported on the Japanese contribution under the Technical Cooperation Programme during the fourth-project year which includes despatch of a total of eight Japanese experts, training of six Malaysian counterparts training in Japan and the provision of equipment equivalent to Yen 25 million. The detail list of these programme components appears as Annex C.

In relation to the discussion of the Working Group Meeting held at VRI on 20 January 1990, the Mission presented to the Meeting the following comments :-

Virology Section

Basic research on ND inactivated vaccine has been completed. To make those vaccines available for field use, further studies on efficacy comparison with conventional vaccines, evaluation of the merit and vaccination programme are recommended. It is understood that most of these studies will be conducted collaboration with Biologic Department of VRI.

Immunosuppression tests of isolated IBDV have been conducted and compiled into a report. It is recommended that pathogenicity tests into IBD, as well as IB, MD be continued with a projection of anticipated new findings.

Basic techniques in ELISA methods have been introduced and now are available as an antibody detection technique in certain diseases. Field tests of these ELISA methods may be conducted in near future. Development of ELISA techniques for the other avian diseases should be continued.

Laboratory techniques have been introduced in broad area through four Japanese experts despatched and trainings of Malaysian counterparts in Japan. Those techniques are expected to be applied in research and sustain at the Centre.

Parasitology Section

Despite the efforts, the colonization of C. arakawae has not been successful and no significant progress in the research of leucocytozoonosis is made. Improvement of the devices is required to succeed in colonization of midgets.

Various coccidiostats have been collected to test the drug-sensitivity of Eimeria which was isolated last year. However, the detail examination remained not pursued.

Delay in research activities proposed for 1989/90 was mainly due to the absence of the Research Officer because of his training in Japan. His training was successful and the application of knowledge in research activities is very much expected.

Pathology Section

This section was strengthened by the successful training of Research Officer in Japan and the despatch of a Japanese short-term expert in Electron Microscopy. However, not much progress was achieved at the beginning of the year due to the series of official events taking place at the Centre and time taken in for the training of Research Officer.

Techniques in electron microscope operation, sample preparation and ultra-histopathological analysis have been introduced to the Centre.

Research on innoculation of duck hepatitis virus to duck embryos was conducted and latest techniques such as immunoperoxidase method have been successfully introduced.

Bacteriology Section

Studies on Infectious Coryza have been conducted succeeding the outcomes from previous years' activities. Certain results have been acquired in the areas of isolation of H. paragallinarum A type strain and vaccine efficacy tests against it, and isolation of H. avium for the first time in Malaysia. Efficacy tests of Infectious Coryza vaccines are still continued.

Broad labortory techniques in isolation and identification of Mycoplasma bacteria have been introduced by the Japanese expert.

Epidemiology Section

This section has only been able to provide a supporting role for

the other sections like collating and processing data for publication, due to the absence of its head.

SPF Chicken Unit

No specific problem in SPF chicken husbandry and egg production was seen. However, the breakdown of one of the two air chillers of the building will cause a serious problem when any trouble occurs to the other chiller. It is the compressor not being able to operate even after its rewinding.

The annual average consumption of SPF eggs at the Centre was only 58 percent of the production with the range of 14.2 to 103.8. It is hoped that, with an increase of research activities, consumption will match the output of the eggs.

Technical problems in SPF flock monitoring have been solved in most of diseases except in LL which can employ the established methods in Japan.

The Meeting took note of the suggestions raised by the Mission and agreed that the various research sections at the Centre would take the necessary steps to improve their activities.

4. PROGRESS OF PROJECT

The Director of VRI informed the Meeting that, in his views, the overall progress of the Project was quite satisfactory. This is especially true with respect to the maximum capability of the available manpower at the Centre. He further expressed that the desirability of the Project with regard to the number and

quality of human resources has been beyond the Centre's control and is still required to be fulfilled.

In its assessment of the progress of the Project, the Mission found that amicable and enthusiastic atmosphere, which is necessary to promote technical cooperation of this nature, has been reinforced in every section of the Centre. The Mission reported that the Project is showing signs of good progress despite delays in the first half of cooperation period.

The Mission also observed that the technology needed for avian disease diagnosis and research has been introduced to the Centre to almost adequate extent as the last JICA mission described. Thus, one of the objectives of this technical cooperation project, that is to upgrade the level of research on poultry disease of economic importance, is partially achieved.

The Mission, however, stressed that applying the acquired techniques in research projects requires more guidance and experience. Certain progress of research activities has been seen in limited fields. Yet, in most areas, it is recommended that research design, experiment procedure and analysis of the results be improved. A meaningful research must bring some new findings and contribute to the public interest. The Mission expressed its feeling that the Centre needs a further period of guidance or cooperation to develop its manpower so as to enable it to organize and conduct such research.

Furthermore, the Mission noted that the Centre is built for the purpose of disseminating research results and technologies to the other ASEAN countries through training, thus contributing to manpower development in poultry disease research in the ASEAN countries. This

extension of established techniques to ASEAN countries has taken place through ASEAN seminars and diagnostic technique courses. However, the Mission was of the view that the Centre would need several years of further development in order to play such an effective role.

The Meeting noted the satisfactory progress achieved by the Project thus far and agreed that the future development of the Centre would emphasize on the human resource development.

5. ANNUAL WORK PLAN FOR THE FIFTH PROJECT YEAR

The Director of VRI, as the Chairman of the Working Group Meeting, presented the Annual Work Plan for the fifth-project year as appears in Annex D. The various highlights discussed by the Meeting were noted as follows :-

5.1 Research Activities

There would be a total of 14 projects to be undertaken during the fifth-project year, of which 8 will be in virology.

With regard to the various topics on research to be carried out in the fifth-project year, the following comments were reported by the Mission :-

Virology Section

The Mission felt that the future research plan needs concentrations in topics projecting on anticipated new findings.

Parasitology Section

With the present staff situation, the main subject of this section should be studies on Coccidium. Studies on Leucocytozoonosis is better to be kept as a subsubject.

In the early part of this year, effort should be concentrated on studying the biological characters of E. maxima, including the drug resistance, isolation of the other strains of E. maxima, and collection of field Eimeria strains other than E. maxima. The work plan revised after discussions is acceptable.

Pathology Section

Concentration on one programme in the study on IBDV is preferred.

Bacteriology Section

Studying monoclonal antibody techniques and DNA hybridization techniques should take place when the research progresses to the stage required by these sophisticated techniques. The other topics are acceptable.

Epidemiology Section

Topics suggested are acceptable, considering the present situation of the section. However, the Mission felt that this section should concentrate in more scientific activities. Works such as publications could be given to the administration section.

The Director of VRI accepted all the comments made by the Mission as helpful suggestions and, thus, the Meeting noted that necessary actions should be taken.

5.2 Request for Japanese Experts

The Malaysian side requested for 4 experts as follows :-

3 Long-term experts

1 Virologist
1 Pathologist
1 Bacteriologist

1 Short-term expert

1 Parasitologist

In consideration of the unexpected problems that would arise from the assignment of the long-term experts, the Director of VRI proposed that the Japanese side would consider conversion of the long-term experts into short-term experts.

Comments reported by the Mission on the assignments of Japanese experts are as follows :-

Virology

One long-term expert may be required to undertake training in the three topics suggested and including guidance for the new Research Officer.

Pathology

One long-term expert may be required to supervise the section to establish avian pathology including electron microscopy and conventional histo-pathology, and to introduce the relevant laboratory techniques.

Bacteriology

One long-term expert may be required to supervise the research activities.

Parasitology

One short-term expert may be required for establishment of midge colonization.

Chicken-Isolator Operation

One short-term expert may be required to further train proper operation of chicken isolator in the Experimental Chicken House when a specific experiment is conducted.

The Mission agreed to the proposal by the Director of VRI on the conversion of experts and was of the view that some short-term experts allocations should be reserved in case the required long-terms experts are not recruited.

On the suggestion for the expert on chicken-isolator operation, the Director of VRI informed the Meeting that the actual need for him would depend on the outcome of further trials using the isolator.

Thus, the Meeting noted that these request for the Japanese experts would be conveyed by the Mission to the Japanese Authorities.

5.3 Request for Counterparts Training in Japan

The Director of VRI proposed that, on the Malaysian counterparts training in Japan, it would require 4 of the Centre's staff to be trained in virology, bacteriology, pathology and epidemiology.

A special request was also made by the DVS headquarters to allow a visit to Japan by a senior Malaysian official involved in the Project.

The Mission expressed their views with regard to counterparts training as follows :-

Virology

The newly assigned Research Officer is recommended to have his training in Japan after working with a Japanese expert for a certain period.

Pathology

Training of Laboratory Assistant in histo-pathology should be reserved until a particular subject to study in Japan emerges.

Bacteriology

The Laboratory Assistant may be sent for training in laboratory techniques of Mycoplasma. However, it is feared that her absence may cause delay in planned activities, unless additional Laboratory Assistant is assigned.

Epidemiology

An assistant may be sent for training in field survey and data collection techniques.

The representative of the Economic Planning Unit of the Prime Minister's Department (EPU), Malaysia, sought clarification on the purpose of the special request for the visit of a senior official in Japan. The Meeting was informed that the visit would help the Malaysian official observe the latest research development in Japan for the purpose of exploring future programme for the Centre.

In considering this request, the Mission agreed that such a need would be beneficial to the Centre.

The Meeting noted that the request for 5 training allocations would be conveyed by the Mission to the Japanese authorities.

5.4 Request for Equipment Provision from Japan

The detail list for equipment needed as proposed by each section of APDRTC is shown in the relevant portion of Annex D. With regard to this list, the Malaysian side informed the

Meeting that a further review on the need for equipment would be based on the priority and the operating cost considerations.

In reply to this matter, the Meeting agreed that the Centre would review its need of the equipment, and transmit its final list to Japan through the official channel.

5.5 Third-Country Training Programme

The Meeting was informed that the Third-Country Training Programme (TCTP) for the fifth-project year would involve one ASEAN seminar and one course on basic diagnostic techniques. With regard to the course, the Meeting noted the suggestion by the Director of APDRTC that the course contents would concentrate on the specific requirement of the participants.

6. FUTURE PLAN AFTER TERMINATION OF PRESENT COOPERATION PERIOD

The Chairman requested the Malaysian side to present its views on the future plan after termination of present cooperation period.

The International Desk Officer of the Department of Veterinary Services (DVS), Malaysia, informed the Meeting that following the recommendations of the Meeting of the ASEAN Directors of Livestock/Veterinary Authorities on the Project, held at APDRTC on 27-28 February 1989, the Twelfth Meeting of the ASEAN-COFAF Coordinating Group on Livestock (CGL) held in Bangkok, Thailand, on 27-28 July 1989, adopted the proposal for extension of APDRT Project. The proposal was subsequently approved by the ASEAN-COFAF at its Nineteenth Meeting on 22-25 August 1989 and the ASEAN Standing

Committee Meeting on 22 September 1989. Therefore, ASEAN would submit the proposal for extension for consideration at the next ASEAN-Japan Forum, tentatively in October 1990.

The Malaysian side further informed the Meeting that the ASEAN objectives for the extension are as follows :-

(i) to upgrade and improve the level of existing research in the other ASEAN countries through joint-ASEAN research and more direct involvement and utilization of the facilities at the Centre;

(ii) to improve the present activities, such as the scope of research and training, at the Centre that would be of relevance to member countries;

(iii) to provide the other ASEAN countries with the necessary equipment and research materials that are urgently needed for immediate application following training programme at APDRTC;

(iv) to enhance dissemination and exchange of information and research results through publication of scientific bulletin on poultry diseases and APDRTC newsletter;

In reply to the views given by the Malaysian side, the Mission confirmed to the Meeting that it could explore any proposal by the Malaysian side for future plan of the project after termination of its present cooperation period, but has no authority to discuss the extension of the Project especially in relation to such ASEAN objectives. In this connection, the Meeting was of the view that the proposal from the ASEAN side should be left for discussion at the ASEAN-Japan Forum. The Mission further commented that a project with such ASEAN objectives mentioned should be considered as a seperate project on the second phase but not as an extension of present bilateral cooperation.

The Meeting was further confirmed by the Malaysian side that in view of the current bilateral arrangement terminating in April 1991, Malaysia would like to request an extension of the Project up to a maximum of five years with the same terms and objectives of the original Record of Discussions, signed on 17 April 1986, subject to the result of the final Joint-Evaluation to be conducted in late 1990.

The Malaysian side stressed the importance of further manpower development in order to upgrade the Centre's capabilities as a research, training and reference institution of an internationally recognised standing. In order to achieve this target on a faster pace, the Malaysian side further informed that it would still need the Japanese assistance in one form or another for the next few more years.

With regards to this matter, the Mission informed the Meeting that the wishes for an extension of the Project were extended to the Mission from all the sections and the Director of the Centre, the Director of VRI and DVS headquarters. However, these wishes were expressed with a comment that the extension should be considered based on a mutual desire of the Malaysian and Japanese sides.

The Mission further observed that the Centre is now equipped with most of technologies necessary to diagnose and to carry research on poultry diseases. This indicates that the objective of this technical cooperation project, that is to upgrade the level of research on poultry disease, has been partially achieved. Nevertheless, the Centre requires a few more years to develop the manpower to the level at which they could conduct more effective research and would play the role as an ASEAN Centre.

In relation to this, the Mission was of the view that a cooperation project such as this should be continued until the stage that its results and effects are seen to sustain at the recipient organization.

The representative from EPU informed the Meeting that based on her experience with the extension of the Japanese Cooperation Project, the scope of the extension varies depending upon what components of JICA technical cooperation are required. In this respect, she requested for clarification on the detail components of the extension request.

In reply to this, the Meeting was informed that the important components would be in the area of counterparts training in Japan and the experts despatch programme for the purpose of strenghtening the need for manpower development. The Director of VRI further informed the Meeting that the request for equipment may be of low priority in the extension programme.

With regard to the request for the extension and its detail components, the Mission commented that this could be discussed during the joint-evaluation exercise in the next Japanese fiscal year (1990/91).

The Chairman expressed his hope that the Mission would take note of the request for the extension from the Malaysian side and would convey it to the Japanese authorities. In this connection, the Mission agreed to take note of the request and would convey the matter to the Japanese authorities.

7. OTHER MATTERS

The Mission proposed several recommendations in order to allow for the improvements of future activities of the Project. The following items on the recommendations were expressed to the Meeting :-

(i) The personnel situation of the Centre has been improved in some areas following the last mission's recommendation. This Mission views the Centre should have an increase of its staff for further development, in the area of;

(a) Bacteriologic Research and Laboratory Assistance,
(b) Histo-Pathologic Research and Laboratory Assistance,
(c) Parasitologic Research and Laboratory Assistance,
(d) Mechanical and Electrical Maintenance, and
(e) Publication.

(ii) ASEAN Poultry Disease Seminar and Diagnostic Techniques Courses under the Third-Country Training Programme may be better organized if it could concentrate in one specific discipline or area of interest per seminar or course.

(iii) Publication of the Centre's information should be commenced at the possible earliest time as recommended by the last mission.

(iv) The air-chiller of SPF Unit should be repaired immediately.

(v) Requests for Japanese experts, Malaysian counterparts training and equipment provision should be submitted through the formal channel at the earliest stage of the Japanese fiscal year. The same applies to the draft of Third-Country Training Programme.

In his response to these suggestions, the Director of VRI informed that he agreed to all the recommendations made by the Mission. He further added that with regard to the staffing of the Centre, DVS has made a request for 13 extra staff, which includes research officers and laboratory assistants, under the Sixth Malaysian Plan (1991-95).

In his closing remarks, the Chairman thanked the Mission and members of the Meeting for their efforts in preparing the Work Plan and in facilitating the discussions at the Meeting. He then officially closed the Meeting.

ANNEX A

A G E N D A

Annex A

The Fourth Joint-Committee Meeting of the
ASEAN Poultry Disease Research and
Training Project, Kuala Lumpur, Malaysia
23 January 1990

Agenda

1. Opening
2. Adoption of Agenda
3. Review of Project
4. Progress of Project
5. Annual Work Plan for Fifth Project Year
   - 5.1 Research Activities
   - 5.2 Request for Japanese Experts
   - 5.3 Request for Counterparts Training in Japan
   - 5.4 Request for Equipment Provision from Japan
   - 5.5 Third-Country Training Programme
6. Future Plan after Termination of Present Cooperation Period
7. Other Matters

ANNEX B

PROJECT REVIEW REPORT

ASEAN Poultry Disease Research and Training Centre 1989

The year 1989 was marked by two very important events: first the official opening of the ASEAN Poultry Disease Research and Training Centre (APDRTC) by the Honourable Minister of Agriculture Datuk Seri Sanusi Junid on 27 th February; and second the production of the first SPF egg (weight-43.2gm) on 17th February. Besides these two events, there were also the ASEAN Seminar on Viral Diseases of Poultry: Diagnosis and Control held from 19 - 28 February and the ASEAN Directors of Livestock/Veterinary Authorities Meeting from 27 - 28 February at the APDRTC.

Staffing

During the year, there was one resignation - a very crucial one. Dr. Chai Kim Kheong, head of virology, resigned from the APDRTC effective from the end of April to seek greener pastures in the private sector. His replacement is Dr. Wan Mohd. Kamil Wan Nik who reported for duty on the 15th of April. Mr. Lim Kean Teik was made head of the virology section replacing Dr. Chai Kim Kheong.

Mrs. Siti Zaleha Abu Talib was transferred to the Regional Veterinary Laboratory in Johor Bahru for personal reasons and her place was taken over by another senior technician, Mrs. Tan Lin Jee.

Mr. S. Ganesan was transferred from the Regional Veterinary Laboratory in Bukit Tengah to the Electron Microscopy Unit from August to understudy Mr. Yap Hon Choong and Mr. Magendran was moved into the epidemiology section from July.

A complete list of APDRTC staffing and projected staffing under the 6th Malaysia Plans (1991-95) is as attached.

Research

When the APDRTC buildings (Phase I) were completed and handed over to the Government of Malaysia on 18 th January 1988 it was said with some pride that the buildings were some of the finest seen anywhere. What was also said on the occasion included that buildings by themselves don't produce anything. It's people working with people, Malaysians with Japanese together, that will eventually produce research findings and results which befit a facility such as this one.

Research carries different meanings in different countries. Our research may not come within the standards set by others in the developed world. It may not even be taken as research at all. But as long as we are clear where we are going and what we are aiming for it should suffice for now. The set of people we have in APDRTC with one exception has had very little exposure in a research environment. They need the experienced kind of research leadership which we are looking for in the Japanese experts. They need not only to know how to carry out a particular technique but also some blueprints on what is researchable, how to go about doing it and what may or may not be

expected. We are developing in every sense of the word. And this is a long and painful process. It will take years before we can see results.

The individual sections would have reported on their activities for 1989 and so I shall not repeat them here.

ASEAN Commitments

To the best of my knowledge we have honoured all our obligations to our ASEAN partners. In two years from March 1988 to March 1990 we would have done/or will do a total of five courses, exactly as required of us under the R/D signed in 1987. That's a total of 17 weeks of actual course time or 16% of all available time in that period.

Publications:

1. Chai, K.K., Yuasa, N. (1989) Antibodies against Reticuloendotheliosis Virus and Chicken Anaemia Agent in Chicken Sera J. Vet. Mal. Vol. 1 No. 1. p. 11 - 16.

2. Zaini, M.Z., et al Isolation of H. avium from a Malaysian Poultry Farm (In print).

3. Ohta, H et al Allogenic red blood cell recognising factor in normal chicken kedney cells (Submitted to Nature but returned as unsuitable for publication).

4. Presented at the First Congress Veterinary Association Malaysia March 10 - 12, 1989.

   4.1. Establishment of the Enzyme-Linked Immunosorbent Assay (ELISA) System and its Application in the Monitoring of Newcastle Disease by Dr. Chai, K.K.

   4.2. Serotyping of Haemophilus paragallinarum by the Dot-blotting Technique by Mrs. Zaini, M.Z.

5. APDRTC information booklet.

6. Other Technical Reports.

International Hostel

The international hostel provided accomodation to at least 300 registered guests. This is twice the number of registered guests as compared to 1988 when 151 were registered.

The average room occupancy rate stood at 21% with a range of 1.6% to 42.9%. While the occupancy rate did not differ very much from the previous year, having twice the number of guests implied that workload had doubled.

Of great significance was the fact that we played host to at least one Ambassador.

STAFFING FOR THE

ASEAN POULTRY DISEASE RESEARCH AND TRAINING CENTRE (APDRTC)

VRI, IPOH.

While the APDRTC is considered part of the VRI complex which also includes the School for Veterinary Laboratory Technology and the Biologics Unit, the APDRTC is viewed as a distinct entity for project purposes and to give the Centre an ASEAN identity.

Of the staff allocated for the VRI, the following will constitute the official staff establishment for the ASEAN Poultry Disease Research and Training Centre.

Posts	Present Establishment	Remarks
Director (1) S.S.'G'	1. Gan Chee Hiong	
Chief Clerk (1)	2. VRI pool	
Finance Clerk (1)	3. VRI pool	
Service Clerk (1)	4. Khadijah	Casual J/Clerk
(Japanese Experts - 3) (Secretary - 1)	Ikeda, H. Ohta, I. Mukai Wong Mei Ling	On JICA payroll
Typist (2)	5. Norazian	1 typist adequate presently
Office boy (1)	6. Sundaraj	
Watchman (1)	7. VRI pool	
Driver (2)	8. VRI pool 9. VRI pool	
Labourer (4)	10. Savariar	

Virology			
Head (1) VO/RO	11.	Lim kean Teik	Section has more than fulfilled original projection.
	12.	Wan Kamil	
LA (2)	13.	Lim Siew Sam	
	14.	Cheah Ngan Yoke	
	15.	Zabidah	
Bacteriology			
Head (1) VO/RO	16.	Zaini Mohd. Zain	
LA (2)	17.	Tan Lin Jee	One vacant
Parasitology			
Head (1) Vo/RO	18.	Rahmat Sheriff	
LA (2)	19.	Param	One vacant
Pathology (incl. EM)			
Head (1) VO/RO	20.	Mahani Hamid	
LA (4)	21.	Yap Hon Choong	
	22.	S. Ganesan	
	23.	Zuraidah	One vacant
Washing/Sterilisation(1)	24.	Arumugam	
	25.	Harizan	
	26.	Ismail	
Store (1)	27.	VRI pool	
SPF Poultry Unit			
Supervisor (1) VA	28.	Lip Kim Lock	
Labourer (1)	29.	Kumar	
Experimental Chicken House (1)	30.	From Labour pool	Part time basis.
International Hostel			
Caretaker (1)	31.	VRI pool	
Cook (2)		Not required	Rely on catering
Labourer (2)	32.	VRI pool	

Epidemiology

Head (1) VO	33. VRI pool	Presently on study leave
LA (2)	34. Tan Choong Lian	
	35. Magendran	

Feedmill

Supervisor (1) - VA	36. Peter Mangalan	
Labourer (1)	37. Samy	
M & E Technician (1)	On request	

45 (4)	37 positions filled as of 1.1.1990.

SIXTH MALAYSIA PLAN REQUEST

Increase in stafing in the 6th Malaysia Plan will only affect the research laboratories while no increase is anticipated in the other areas of the Centre. Tabulated below are the staff increases requested for during the period 1991 - 1995.

Posts	Current Establishment	Additional Request 1991 - 95
Virology		
Head (1) VO/RO	1. Lim Kean Teik	VO/RO (1)
	2. Wan Kamil	
LA (2)	3. Lim Siew Sam	LA (2)
	4. Cheah Ngan Yoke	
	5. Zabidah	
Bacteriology		
Head (1) VO/RO	6. Zaini Mohd. Zain	VO/RO (1)
LA (2)	7. Tan Lin Jee	LA (2)
Parasitology		
Head (1) Vo/RO	8. Rahmat Sheriff	VO/RO (1)
LA (2)	9. Param	LA (2)
Pathology (incl. EM)		
Head (1) VO/RO	10. Mahani Hamid	VO/RO (1)
LA (4)	11. Yap Hon Choong	
	12. S. Ganesan	
	13. Zuraidah	
Epidemiology		
Head (1) VO	14. VRI pool	VO/RO (1)
LA (2)	15. Tan Choong Lian	LA (2)
	16. Magendran	
	Total	= 13 new posts

Total No. of Posts = 58

ANNEX C

DETAIL LIST OF JAPANESE CONTRIBUTION

1989 / 90

1. Experts

(1) Long-term

Name	Duration	Post/Section
Dr. SHOYA, Shigemi	15/10/86 - 14/04/89	Leader cum Pathologist
Mr. MUKAI, Ichiro	26/09/88 - 25/09/90	Coordinator
Dr. OTA, Hiroaki	11/04/88 - 10/04/90	Virologist
Dr. IKEDA, Sumio	18/08/88 - 17/08/90	Virologist

(2) Short-term

Name	Duration	Post/Section
Dr. OGATA, Muneo	11/09/89 - 10/12/89	Leader cum Epidemiologist
Mr. KARASAWA, Shigeru	11/09/89 - 09/10/89	SPF Flock Management
Dr. YAMAMOTO, Koshi	25/09/89 - 23/12/89	Bacteriologist
Dr. HARITANI, Makoto	25/10/89 - 20/01/90	Pathologist

2. Counterpart Training in Japan

Name	Section
Dr. Rahmat bin S. M. Sheriff (13/03/89 - 27/09/89)	Parasitology
Dr. Mahani binti Abdul Hamid (13/03/89 - 27/09/89)	Pathology
Dr. Hadi bin Dato Hashim (06/11/89 - 19/11/89)	Observation (Research Management)
Mdm. Cheah Ngan Yok (24/07/89 - 23/12/89)	Virology
Mr. Yahya bin Muhamad (March 1990 - 2 weeks)	Cooperation Management
Mr. Ganesan (March 1990 - 5 months)	Electron Microscopy

3. Equipment Provision

Following items were officially requested, and are under procedure of purchase.

Bacteriology

Item	Quantity
Microcentrifuge	1
Microcentrifuge Tube	4
Microcentrifuge Tube Rack	10
Pressure Vessel Holder	1
Pressure Vessel	1
Microwave Oven	1

Virology

Item	Quantity
LN_2 Tank	1
CO_2 Tank	3
Egg Incubator	1
Ultra Filter Set	1
Filteration Tank	1
Filter Holder	1
Ultracentrifuge Rotor	1

SPF Unit

Item	Quantity
Debeaker	2

Pathology

Item	Quantity
Research Microscope	1
Slide Projecter	1

ANNEX D

ANNUAL WORK-PLAN FOR FIFTH PROJECT YEAR

PATHOLOGY SECTION

I. Annual Report 1989

i) From January-February work in Pathology Section consisted mainly on processing specimen collected from the field for layer disease investigation and preparing histoslides of various diseases for Dr. Mahani training in Japan.

ii) All staff were involved in organizing committee for the APDRTC opening ceremony.

iii) Dr. Mahani went to Japan for a course in Poultry Pathology from 13.3.1989 to 27.9.1989.

Mrs. Zuraidah, the Junior technical assistant remained in the section to improve her skill on preparing histology sections and on various staining techniques. Her work also including processing specimens for histology examination sent by other sections and SPF.

Mr. Yap Hon Choong continued collecting micrographs of some avian pathogens and involved in joint study with the virology section.

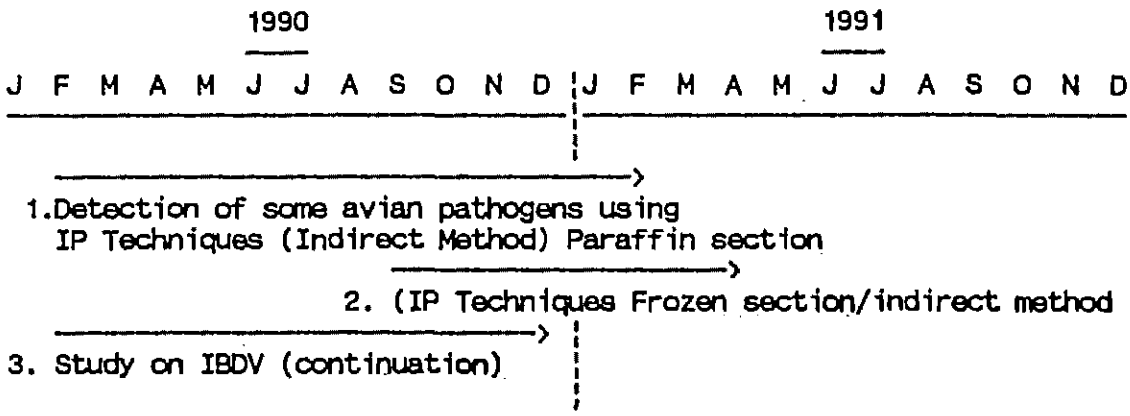
In August, Mr. Ganesan, a senior technician from MDV Bukit Tengah was appointed to train in the EM unit under Mr. Yap Hon Choong.

iv) A short term expert for three month in EM, Dr. M. Haritani came at the end of October. A study in Duck Hepatitis Virus in duck embryo employing light microscopy and electron microscopy observation together with immunoperoxidase

technique was conducted. Other items done were preparation of specimen for immuno electron microscopy, study on IBDV and production of micrographs of some avian pathogens.

v) Full report on the results of the counterpart training for Dr. Mahani had been submitted to JICA office in Tokyo.

II. Short term Plan for Pathology Section



1. Indirect Immunoperoxidase techniques

a. The indirect method using paraffin section will be tested first using hyperimmune sera prepared in rabbit. Recently we were successful to demonstrate the IBDV in tissues of bursa of Fabricius using Immunoperoxidase method from experimental infection. The hyperimmune serum used was prepared by the virology section of APDRTC. Previously we thought that the availability of hyper immune serum will be the major problem for trying the method here. We hope to use this method for diagnosis of field cases later. Some viruses will be tested are IBV, NDV, ILTV, DHV and bacteria including H. paragallinarum, P. multocida and P. anatipestifer in ducks.

2. Direct Immunoperoxidase techniques

Preliminary test will be carried out later as the cryostat specimen holder still not available. This test is more rapid but need unfixed tissue and frozen section.

3. Study on Infectious Bursal Disease

This is a part of research project done by the virology section under Dr. H. Ohta and Dr. Wan Mohd. Kamil. Results obtained from the experiment observed by using light and electron microscopy showed that the isolate is pathogenic to SPF chicks. Further work should be done on this virus ie the pathogenicity under field condition, interaction with other pathogens difference with other isolates etc. Proposal for continuation of the IBD project had also been proposed by Dr. M. Haritani, the pathology Expert (Oct. 1989 - Jan 1990).

Requirement for Japanese Expert

The pathology section needs a medium term expert (6 months-1 year) especially in the field of immunohistology and electron microscopy. The expert will be involved in research type project.

III. Publication

- Crytosporidia in the bursa of Fabricius (in writing)
- Pathogenicity of MI strain of IBDV isolated in Malaysia (in writing).
- Demonstration of MDV antigen in the feather follicles from experimental bird (in writing).

IV. Equipment Required

1. Slide Cabinet	Drawer, upright	BDH	5
	separating spiral	"	
	Drawer, horizontal		1
	cover plate		5
2. Homogeniser	Head,	BDH	1
	dispering tool		2
	retrat stand		1
	bosshead		1
3. Pipette filler	Volac Universal	BDH	6
4. Fume hood/Fume cupboard.	Bench type	"	2
5. Microtome knife			2
6. Microtome acessories,	case		2
	stropping back		2
	knife handle		2
	strop paste		2
	Back strop		2
7. Disposible microtome knife			10pcs
8. Ultra-voilet lamps			2pcs.

Activities of the Pathology Section.
[as medium term planning written in 1989]

Progress of the above.

Projects 1

1. Survey on layer Disease in 3 commercial farm.
   Preliminary result for this survey had been handed to Evaluation Team in February 1989. With very limited figures no conclusion could be made from the result above. I would like to terminate this survey for the following reasons:-
   a) Response and cooperation from the farmers were poor although we went to collect the birds ourselves.
   b) Availability of vehicles and drivers were limited because this survey needed those three times per week. Trip to Kampar about 30 miles from the APDRTC was time consuming.
   c) Thirty percent of carcasses received were autolysed when arrived although we provided cool box while live birds collected sometimes were culled from other sheds.
   d) In one farm driver had to look and fetch the dead bird in cages from already identified shed. This was not a good practise because he might be blamed for speading diseases.

2. Survey on occurance of Cryptosporidia in broiler farm in Perak.
   This survey will be continued using bursa of Fabricius from birds collected by other sections especially Bacteriology and Parasitology.

3. Preparation of Electron Micrographs .
   This will be continued and to follow the previous format done together with Dr. Haritani, Mr. Yap Hon Choong and Mr. Ganesan.

4. Cryoultramicrotomy - specimen processing.
   Equipment is not bought.

mahani Jan 1990.

ASEAN Poultry Disease Research & Training Project

Counterpart Training Record Sheet

1 Year : 1989/1990
2 Subject : POULTRY PATHOLOGY
3 Name : MAHANI BT. ABD. HAMID
4 Duration : 13 / 03 / 1989 - 27 / 09 / 1989

5 Place of training : NATIONAL INSTITUTE OF ANIMAL HEALTH, GIFU, JAPAN.

(1) Technical Training

Name of Institute	Person In-Charge	Duration	Items learned
NIAH, GIFU	DR. M. NARITA	5 1/2 MONTHS	STUDY ON MAREK's DISEASE
			- AUTOPSY, PROCESSING,
			OBSERVATION OF RESULT.
			- FLUORESCENCE ANTIBODY TECH.
			- IMMUNODIFFUSION.
			- IMMUNOPEROXIDASE TECHNOLOGY
			- INTRO. TO ELECTRON MICROS.
			STUDY OF SLIDES

(2) Observation Tour

Name of Institute	Interest of observation
NIAH, TSUKUBA	PATHOLOGY SECTION AND VIROLOGY SECTION.
TOCHIGI LIVESTOCK	LABORATORY.
CENTRE	
SEKI ANIMAL STATION	EXPERIMENTAL STATION FOR CHICKEN.
OKINAWA LIVESTOCK	LABORATORY
CENTRE	
OKINAWA TROPICAL	EXPERIMENTAL STATION FOR JAPAN CATTLE (LOCAL).
ANIMAL DISEASE CENTRE	

6 Suggestions or Comments for Training (besides the "Final Report")

NONE

PARASITOLOGY DIVISION, APDRTC

A. PRESENT ACTIVITIES

a). Annual Report

i) 16 - 19 January 1989 carried field survey in Selangor farms

ii) involved in organising committee for the opening ceromony of APDRTC (on 27 February 1989)

iii) 13 March to 27 September 1989
went for Counterpart Training In Poultry Parasitology in Japan;
during this time:-
a) two more field survey were carried out namely at Johore in late March and at Pahang in early July
b) a specialised short-term attachment course was arranged for the Laboratory Assistant of this section at the Institute for Medical Research, Kuala Lumpur
c) SPF monitoring :-
fourth monitoring on 2 May 1989
fifth monitoring on 15 August 1989

Full report on the results of the above Counterpart Training was written in the Final Report form and was submitted to JICA, Tokyo.

iv) October to November,
a) made experiments on separation and isolation on various species of coccidia collected from local isolates during field survey
b) trials on colonisation of Culicoides species. The colony system was reestablished and we are still trying to produce many First generation adults so that they can furtner reproduce
c) immunological studies using SDS-PAGE and Western Blotting technics on coccidia and Leucocytozoon

b) Scientific/Technical Reports

i) presented a paper entitled "Studies on Resistance of *Eimeria maxima* NA-1 To Nine Anticoccidial Drugs" at the ASEAN Seminar On Poultry Viral Diseases - Diagnosis and Control

ii) submitted corrected version of a paper entitled "Purification of *Eimeria maxima* From A Mixed Infection of Coccidiosis In A Layer Farm In Malaysia"

iii) co-author for a paper entitled "Anticoccidial Effect of Sulphachloropyrazine" written in Japanese and was presented at the Japanese Veterinary Congress" by the main author, Dr. Kameo Shimura on 2 October 1989

iv) a complete report entitled "A Trial On The Cultivation of *Eimeria tenella* in chicken embryos. (Comparison on the development of the coccidium in chicken embryos inoculated with diferrent doses)" was written on the completion of 4 weeks training at Ibaraki University and was submitted to Assoc. Prof. Dr. Yutaka Nakai.

B. WORKING PLAN

1) ANNUAL WORKING PLAN

a) RESEARCH

During the training in Japan, discussions have been made with various Japanese experts on research plans to be carried out at APDRTC. From the discussions, some topics have been suggested and advised on. The topics cover on work in coccidiosis and on Culicoides colonisation. However these topics are somewhat different from those included in Short and Medium term plans prepared in early 1989. The difference is because it is felt that research in parasitology should first concentrate on getting basic information and collection of base-line data before carrying more elaborate studies in the future. And of these topics greater emphases will on coccidiosis.
Thus the topics of research for 1990 and for the future are as follows :-

RESEARCH ACTIVITES	1990	FUTURE (1991 - 1993)
A. COCCIDIOSIS		
a) survey of poultry farms	←———	———→
b) studies on biological characteristics of local strain of *Eimeria maxima*	←→	
c) assessment of efficacies of additional anticoccidial drugs on the local strain of *E. maxima*	←→	
d) immunological studies		←———→
B. LEUCOCYTOZOONOSIS		
a) establishment and maintenance of *Culicoides* colony	———	———

EXPLANATORY NOTE :-

A) COCCIDIOSIS

a) the work on survey of poultry farms is necessary to collect more samples and to isolate various species of coccidia that are prevalent here.

b) with the species of *E. maxima* that was isolated locally, more studies will carried out to determine its biological characteristics especially on its pathogenicity in chickens

c) so far several anticoccidial drugs have been tested on the local strain of *E. maxima*. For this year further assessment on some additional drugs will be carried out.

d) immunological studies on coccidiosis will be carried out in the future after much information and base-line data are collected and after all prevalent species of coccidia are isolated.

B) LEUCOCYTOZOONOSIS

a) establishment and maintenance of *Culicoides* colony will be carried out along with coccidiosis work, and this will involved finding the most suitable system to propagate *Culicoides* in large numbers so that actual studies on leucocytozoonosis can be carried out in the future.

b) PRESENTATION/SEMINARS

i) will be presenting papers at Malaysian Society for Parasitology and Tropical Medicine (MSPTM) Scientific Conference on 24 Feb. 1990 at Science University of Malaysia,

ii) will participate and will present paper/s at the coming ASEAN Seminar On Poultry Diseases And Their Control on 11 - 17 March 1990.

2) REQUEST FOR JAPANESE EXPERTS

For the year 1990 the section of Parasitlogy of APORTC will like to request for 2 Japanese experts. The suggested fields of expertise, duration, and suggested working plans/research are as follows :-

a) FIELD OF EXPERTISE : Culicoides colonisation, Leucocytozoonosis and Plamodiasis.
DURATION : 3 months
SUGGESTED WORK PLAN :
i) improve on Culicoides colonisation,
ii) establishment of infection of Leucocytozoon and then maintain through serial passages in Culicoides and chickens,

b) FIELD OF EXPERTISE : Coccidiosis
DURATION : 3 months
SUGGESTED WORK PLAN :
a) immunological studies on coccidia

4) Equipment List

ITEM	QUANTITY	ESTIMATED PRICE (M$)
Construction of water piping system for the supply to coccidia experimental rooms Justification : existing water supply is not constant. Most of the time water supply completely stop during operation of the boiling sterilizing machine and caused the machine to get jammed up		
Coccidia infection cages (stainless-steel) Justification : we need more cages for more extensive work in coccidiosis	10	3800
Single oocyst cage Justification : at the moment we have none. These cages are necessary for isolation of coccidia species work	12	3000
Microwave oven Justification : for fast melting of agar for double gel immunodiffusion test in leucocytozoonosis studies, for fast dissolution of sugar, and for sterilisation of contaminated equipments and waste materials after coccidia work. Note : This method is conveniently employed at Dr. Nakai's laboratory at Ibaraki University	1	5000

	ITEM	QUANTITY	ESTIMATED PRICE (HK$)
5	Laminar flow cabinets/ Clean bench		
6	LTE Vulcan Oven/ Drying Sterilizer		
7	Egg setter/ Incubator		
8	Ultraviolet lamps		
	Justification :		
	a) for all items nos. 5 - 8, these are necessary for the work on chicken embryo cultivation of coccidia, which is in accordance with my project proposal (Short and Mid Term Work Plan Table) in also in preparation for Counterpart training under Dr. Nakai soon b) However these matters will be discussed with Dr. Nakai later.		
9	Others "		
	other smaller equipments will be proposed or requested later		

ASEAN Poultry Disease Research & Training Project

Counterpart Training Record Sheet

1 Year : 1989/1990
2 Subject : COUNTERPART TRAINING IN POULTRY PARASITOLOGY
3 Name : DR. RAHMAT S.M. SHERIFF
4 Duration : 13 / MAR. / 1989 - 27 / SEPT. / 1989

5 Place of training : 1) NIAH, TSUKUBA CITY
2) RESEARCH INSTITUTE FOR ANIMAL SCIENCE IN BIO-CHEMISTRY AND TOXICOLOGY, KANAGAWA
3) IBARAKI UNIVERSITY, IBARAKI KEN
4) KYORIN UNIVERSITY, MITAKA CITY

(1) Technical Training

Name of Institute	Person In-Charge	Duration	Items learned
(1) NATIONAL INSTITUTE	DR. KAMEO SHIMURA	5 WEEKS	Anticoccidial drug efficacy
OF ANIMAL HEALTH (NIAH)			studies, etc.
(2) RESEARCH INSTITUTE	DR. KENJI ODA	3 WEEKS	Drug resistance studies,
FOR ANIMAL SCIENCE IN			determination of sporulation
BIO-CHEMISTRY AND			time and prepatent period, single
TOXICOLOGY			oocyst isolation, etc.
(3) IBARAKI UNIVERSITY	DR. YUTAKA NAKAI	4 WEEKS	Cultivation of coccidia in
			chicken embryos and tissue
			culture, etc.
(4) NIAH	DR. NAKAMURA	3 WEEKS	SDS-PAGE, etc.
	DR. SHIMURA		
(5) KYORIN UNIVERSITY	PROF. TSUTOMU MORII	4 weeks	Colonisation of Culicoides,
			Leucocytozoonosis, etc.
(6) NIAH	DR. NAKAMURA	3 weeks	Western Blotting, etc.
	DR. SHIMURA		

(2) Observation Tour NONE

Name of Institute	Interest of observation

6 Suggestions or Comments for Training (besides the "Final Report")

NONE

I. PRESENT PROJECT ACTIVITIES

1. Establishment of ELISA for ALV

Following the recommendations of Dr. Hihara, the serological detection of ALV antibodies will be carried out by the SN test (instead of the ELISA). At present, sufficient stock of the antigen has been prepared and titration of its titre in ffu has been carried out with the assistance of Dr. Ohta. In progress is the neutralisation test.

2. Monitoring of SPF Poultry Flock

	Infection	Test Method	Virus Strain
(i)	ND	HI	F
(ii)	MD	DID	JM, HRPS, HVT
(iii)	IB	DID	M 41
(iv)	IBD	DID	Lukert
(v)	Fowlpox	ELISA	Beaudette
(vi)	ILT	DID ELISA	NS 175
(vii)	ALV	SNT	Subgroup A
(viii)	AE	ES, SN	Van Roekel
(ix)	FAV	DID	Celo
(x)	REO	DID	S 1133
(xi)	REV	DID	T
(xii)	EDS	HI	JPA 1
(xiii)	AI	DID	local isolate

Comments

Two other strains JM and HRPS (serotype 1 and 2) are included for the monitoring for MD. Both strains have been propagated in CEF cells for stock antigen. The introduction of the SN test for ALV is in progress.

3. Training in monoclonal antibody production

This proposed project was not taken up because of other commitments and the lack of Japanese expert to provide guidance. However an attempt will be made in 1990 with the assistance of Dr. Ohta.

4. Research into ND subunit and the production of antigens and antisera for the DID test

Technology for the production of antigens and antisera for DID tests is important and useful in the diagnosis of viral infections of poultry. The DID test is simple and inexpensive and is most appropriate for use in small diagnostic laboratories and Regional Laboratories. In other words, the DID test has most useful applications in ASEAN countries. In view of this, the technology for the production of DID antigens and antisera is important. Once established, the technology could be transferred to relevant laboratories. Research into ND subunits is carried out in order to investigate the antigenicity of ND which is an important disease of poultry in Asia. To date, the following antigens have been prepared:- IB, Fowlpox, Adeno, REO, ILT, MD, REV, IBD and AI. Production of antisera for ILT and IB are in progress. Research into ND subunit is also in progress.

5. ND Inactivated Vaccine Trial

The aim of this trial is to select an improved ND vaccine that confers more uniform, higher and longer lasting protective immunity to all vaccinated chickens.

A total of 936 day old chickens were reared from 1 day of age to 1 year old for this project. The experimental chickens were given 2 live ND vaccinations at 4 days and 5 weeks of age. At 18 weeks old, they were vaccinated with the experimental ND vaccine and monitored for antibody development. Negative controls consisted of 72 antibody-free sentinel chickens of the same age and breed that were kept in-contact with the vaccinated chickens. To date, the following results have been obtained from a total of 4320 sera tested :-

Months post vaccination	GMT of ND - HI antibodies					
	Group 1 144 birds DE 1.0 ml	Group 2 144 birds DE 0.5 ml	Group 3 144 birds Quil A 1.0 ml	Group 4 144 birds Quil A 0.5 ml	Group 5 144 birds DEAE 1.0 ml	Group 6 144 birds DEAE 0.5 ml
0 day	11.4	22.6	9.3	18.3	13.1	16.9
1 month	330	172	126.2	89.2	93.1	75.6
2 months	154	53.9	62.1	46.1	40.3	32.5
3 months	109.4	60.2	66.4	64.3	30.9	39.3
4 months	82.5	TIP	36.2	TIP	TIP	TIP

TIP = Testing in progress

All 72 in-contact Negative Control (sentinel) chickens failed to develop any ND-HI antibodies throughout the 3 1/2 to 4 months post vaccination. All 864 vaccinated chickens developed ND-HI antibodies that were very uniform with GMT as shown in table above that lasted at least 3 1/2 to 4 months post vaccination (and probably longer as the monitoring continues). All the individual titres of the 864 birds and their GMT values were satisfactory and >90% were above the level of total protection against all effects of virulent NDV infection which corresponds a titre of 32 - 64 and above. The project is scheduled to terminate in March 1990 after the challenge test and the vaccine shelf-life test are completed.

6. ASEAN Seminar on viral diseases of poultry - diagnosis and control

Some of the staff from the Virology Section participated in the above seminar which was held in 19 - 28 Feb. 1989.

7. ASEAN Course in specialised diagnostic techniques on poultry diseases

Above course has been scheduled for 3 weeks, starting on 12 Feb 1990. The virology section will run the following practicals:-

(i) Preparation of monolayer culturres and culture media .

(ii) Propagation of ILT and HVT viruses in tissue culture

(iii) Preparation of viral antigens for DID tests

(iv) Preparation of ELISA antigens and coating on ELISA plates

(v) Titration of antisera and antigens

(vi) Concentration and purification of antibodies

(vii) Demonstration of SDS-PAGE for separation of protein molecules.

Practical notes for each of the above topics are being prepared for the participants for reference.

8. IBD Immunoseppression test

Results of the National Survey for IBD infections in the country covering 540 sera from 55 village farms and 1270 sera from 44 broiler farms in more than 86 different districts in the country showed that the infection is widespread in Malaysia. Thirty one out of 55 village farms and 17 out of 44 broiler famrs are positive for antibodies. In view of this there is a need to know if some of the local IBD viruses are pathogenic or immunosuppressive. With the isolation of IBD viruses from non-vaccinated poultry farms, preliminary studies have shown that the isolates are not pathogenic. In view of this, the immunosuppression test was carried out. The studies carried out in 55 SPF day old chicks have been completed and results showed that the local isolates tested are mildly immunosuppressive and provide guidelines for the control of IBD in the country.

II. Plans for Research Activities for 1990 - 1991

1. Development of the SNT for ALV will continue so that the SPF flock can be monitored for ALV infection.

2. Monitoring of the second SPF poultry flock for 13 viral infections will continue.

3. Training in the production of monoclonal antibodies will be undertaken - Antichicken IgG.

4. Research into the effects of detergent and concentration treatment on the HA and precipitin antigens of NDV and AEV.
   Experiments with AE virus require preparation of high titred antigens. Such preparations are difficult to prepare because of the poor growth of AE virus in cell cultures and eggs. It is hoped that detergent and concentration treatments would help to increase the antigen titre of the virus.

5. Development of the DID test for AE

   Serological tests for AE have been associated with long procedures that require 2 weeks or more before results could be known. It is hoped that the DID method could be developed so that results could be obtained earlier.

6. Indirect Immuno Peroxidase (IIP) Technology

The development of the IIP test is useful as a rapid diagnostic method that can be introduced in small laboratories and regional laboratories in ASEAN countries. With the establishment of the procedure and its introduction to these laboratories, better and more rapid diagnosis and control of viral poultry diseases can be achieved. The following infections are to be covered:-

IB	Fowl pox	Fowl Adenovirus
IBD	ILT	
REO	AE	

7. Development of IgG concentration and purification technology

Specific and high titred antisera against various avian viral diseases are important for diagnosis and research into poultry diseases in a laboratory. However, such antisera are not often available commercially and in the few cases that they could be purchased, they are very expensive for routine work.; In view of this, there is a need to develop a simple and relatively inexpensive method of concentration and purification of these antisera that could be carried out in

small laboratories on a modest budget so that once the technology is developed/established, it could be transferred to small laboratories in developing countries.

III. List of Paper Report

1. Report of Field Trip 1988 - Introduction and demonstration of ELISA at the Regional Veterinary Diagnostic Laboratories in Malaysia by Aziz, Chai, Ohta.

2. ELISA for detection of IBV-Chai, Wan, Cheah and Ohta.

3. Allogenic red blood cell recognising factor in normal chicken kidney cells by Ohta, Wan, Chai, Cheah.

4. A report on the monitoring of ND and IB infections in the field with the use of ELISA for antibody detection by Chai, Cheah and Ohta.

5. Establishment of the ELISA system and its application in the monitoring of ND by Chai, Jamaluddin, Cheah, Tan, Ohta.

IV ANNUAL WORK PLAN 1990 - 1991

RESEARCH ACTIVITIES	YEAR 1990												YEAR 1991											
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
1. Development of SNT for ALV	X	X	X	X	X																			
2. SPF Monitoring	X			X				X				X												
3. Training in production of antichicken monoclonal IgG	X	X	X	X	X	X																		
4. Research on effects of detergent & concentration treatments on HA and precipition antigens of NDV and AEV	X	X	X	X	X	X	X	X																
5. Development of DID test for AE	X	X	X	X	X	X	X	X																
6. Development of the indirect immuno peroxidase test for detection of poultry viruses												X	X	X	X	X	X							
7. Development of IgG concentration and purification technology						X	X	X	X	X	X													

V. ASSIGNMENT OF JAPANESE EXPERTS AT APDRTC FOR 1990/1991

1. Production of antisera against viral diseases of poultry in rabbits with the aim of introducing the technology to smaller/regional laboratories

Good quality monospecific antisera are important for the diagnosis and research of poultry viral diseases. Since many of these antisera are not easily available and may be expensive or limited in quantities (if available), attempts to produce them locally have often been frustrated by problems in getting SPF chickens and maintaining complete isolation conditions during immunisation period under local environment and working conditions. The use of rabbits as immunisation hosts is suggested as an alternative.

Request : Japanese expertise is requested to assist in the production of antisera against viral diseases of poultry in rabbits with the use of adjuvants. Some of the antisera required include IB; IBD, fowl adeno, REO, ILT, DVH, avian influenza and Marek's disease. The Japanese expert requested should be a researcher who is knowledgeable, experienced and actively involved in oil emulsion adjuvant technology and immunisation techniques in rabbits, using viral antigens.

Period of assignment of APDRTC: 4 months.

2. Introduction of the Immuno Peroxidase Test (IPT) for smaller Regional Laboratories to detect poultry viruses in submitted specimens and inoculated embryonated cells and cell monolayers

The IPT involving the use of avidin biotin complexes (ABC) is an improved development of the indirect fluorescent antibody (IFA) and ELISA techniques that is now rapidly gaining acceptance in many countries in favour of the older IFA test. The advantages of the IPT include those of the IFA test, high sensitivity and the requirement of only an ordinary light (not ultra-violet) microscope for examination of the stained specimen. In these respects, the IPT would be readily acceptable to regional laboratories where only basic facilities are available. Moreover, the stained specimens can be stored for future reference.

Request

Japanese expertise is requested to establish the IPT procedure for the detection of IB, IBD, fowl adeno, REO, ILT, DVH, avian influenza and Marek's disease viruses in submitted specimens and inoculated chicken embryonated cells and monolayer cell cultures. The Japanese expert requested should be a researcher who is knowledgeable, experienced and actively involved in immuno peroxidase research of poultry viral diseases.

Period of assignment at APDRTC : 4 months.

3. Introduction of the HI test for infectious bronchitis (IB) in chickens and investigation into the correlation between IB-HI titres and antibody responses to IBV vaccination and field infection.

Detection of IB antibodies in chickens by the serum neutralisation test (SNT) has been unsatisfactory due to the existence of numerous IB virus serotypes and on account of the SNT itself which requires the cumbersome procedures of virus cultivation in eggs or cell cultures. The haemagglutination inhibition (HI) test is suggested as an alternative to the SNT for the detection of IB antibodies in chickens. Upon establishment of the haemagglutinin (HA) antigen preparation and HI procedures, research into the correlation of IB-HI titres to vaccination and field infection are to be carried out.

Request :

Japanese expertise is requisted for the preparation of the HA antigen and HI procedures of IB as well as research into IB-HI titres that could correlate to vaccination and field infection.

Duration of assignment at APDRTC : 3 months.

VI. PROVISION OF EQUIPMENT FOR 1990 - 1991

	Quantity
(i) Small size water bath with interchangeable shaker platform	1 unit
(ii) Interchangeable shaker platform for item (i) above for beakers, flasks, etc	3 different platforms
(iii) Mini vertical gel slab cast for electrophoresis complete with power supply unit, plate washing system and accessories	1 set
(iv) Semi-dry transfer unit complete with refrigerated circulation bath, self-contained power supply and accessories	1 set
(v) Laboratory storage shelves with upper and lower storage units:-	
(a) Upper storage unit: D = 40 cm W = 120 cm H = 100 cm With 2 pieces of shelves and glass sliding doors	3 units
(b) Lower storage unit D = 50 cm W = 120 cm H = 80 cm With 2 drawers, below which is 1 shelf with doble door.	3 units
(vi) Shelf for storing caustic acids, alkalis and formaldehyde	2 units
(vii) Hitachi continuous flow rotor, complete with lubricating unit, sealing attachment, rotor body, door, door hole cover	1 set
(viii) Sample injection pump for attachment to (vii) above	1 unit

(ix)	Low temperature circulating water cooling bath for attachment to item (vii) above	1 unit
(x)	Density gradient pump for attachment to item (vii) above	1 unit
(xi)	Pipette aid	3 pcs
(xii)	Biohazard Cabinet	1 unit
(xiii)	Face mask complete with oxygen tank, gas regulator and accessories	2 pcs.
(xiv)	Stainless steel trolley	2 pcs.

Dr. Wan Mohd. Kamil b. Wan Nik, Virology Section, APDRTC

A. PRESENT ACTIVITIES

1) Annual Report

(i) 14th APRIL 1989 - Report for duty at APDRTC, VRI and was assigned to Virology Section as a replacement for Dr. Chai Kim Kheong.

(ii) June 1989 - Undergo a training course in Applied Statistics in Animal Production Research in Agriculture University in Selangor.

(iii) July to December 1989 - Orientation period in Virology section. Since I was previously doing clinical work in the field (Ruminants) for 3 years after my graduation, I had to start from scratch in Avian Virology work. Techniques learned are in:-

(a) Tissue culture (CEF, CK and CEL).
(b) ECH operations and maintenance work.
(c) Freeze - drying.
(d) Electrophoresis and Western-blotting.
(e) Propagation and purification of IB virus - using ultracentrifuge.
(f) ELISA, FA
(g) Field trip
(h) Post-mortem of dead SPF-Chicken (when our pathologist Dr. Mahani was in Japan).

(iv) Conducted trials with Dr. Ohta on

(a) Infectious Bursal Disease virus pathogenicity test.
(b) An Enzyme-linked immunosorbent assay for antibody detection to fowlpox virus.
(c) Marek disease virus pathogeni-city test.
(d) Preparation of standard serum for IB, FP, IBD, MD.

Scientific papers

(a) Co-author for a paper entitled "An Enzyme-linked Immunosorbent assay for antibody detection to fowlpox virus" with Dr. H. Ohta.

(b) Co-author for a paper entitled "A study on pathogenicity of MI strain, Malaysian isolates, of IBDV".

B. Working plan

New Short and Long-term work plan

Research Activities	1990	1991	1992	1993	1994
(i) IB serotyping system based on haemagglutination inhibition test (HIT)	--------->				
(ii) Isolation and pathogenicity determination of MD, IBD, IB, ARV and other viruses	ongoing --------->				
(iii) ELISA Ab detection system: - ILT, MD, IBD, ARV, FAV, EDS, etc. (ND, IB, FP - already established)	ongoing --------->				
(iv) Adaptation of ELISA Ab detection system for field monitoring and experimental analysis of disease outbreaks	ongoing --------->				
~~(v) IB serotyping system based on haemagglutination inhibition test (HIT)~~	--------->				
Long - Term (1 - 5 years)					
(i) IB serotyping ELISA system	--------->				
(ii) Western blotting technique for IB and ND antigenic subunits study					
(iii) Antigen-detection ELISA system establishment for FPV, ALV and other viral diseases.	--------->				
(iv) Adaptation of Ag-detection ELISA system for serotyping	--------->				
(v) Monoclonal antibody technique	--------->				

Experimental Chicken House (ECH)

Annual Report

ECH started its operations again in June 1989 after the whole building was re fumigated. Previous experiments conducted there were vaccination trial of Infectious Coryza vaccines, Fowlpox and IBD studies. Initially there were teething problems of frequent electrical trips occuring which are already rectified now. The ECH was closed down in November for repairs of epoxy floors, air leak from window-sill, heater element of isolator unit and air pressure balancing.

In December, after cleaning and fumigation ECH started operating again. Presently in-vivo studies of IB strains are conducted. Future studies to be conducted are on leucocytoozonosis, Mycoplasmosis, ILT, IBD and IB.

ASEAN Poultry Disease Research & Training Project

Counterpart Training Record Sheet

1 Year : 1989/1990
2 Subject : COUNTERPART TRAINING IN AVIAN VIROLOGY
3 Name : CHEAH NGAN YOK
4 Duration : 24 / JUL / 1989 - 23 / DEC / 1989

5 Place of training : EXPERIMENTAL ANIMAL RESEARCH CENTER,
INSTITUTE OF MEDICAL SCIENCE,
TOKYO UNIVERSITI.

(1) Technical Training

Name of Institute	Person In-Charge	Duration	Items learned
EXPERIMENTAL ANIMAL	PROF. (DR.)	31/07/1989	ELECTROPHORESIS, WESTERN
RESEARCH CENTER,	KAZUYA YAMANOUCHI	to	BLOTTING, AGAROSE GEL
INSTITUTE OF MEDICAL		20/12/1989	ELECTROPHORESIS AND SOUTHERN
SCIENCE,			BLOTTING, PREPARATION AND
TOKYO UNIVERSITI			PURIFICATION OF PLASMID
			DNA, MAINTENANCE OF MOUSE
			COLONY, AND MAINTENANCE
			OF MYELOMA CELLS.

(2) Observation Tour

Name of Institute	Interest of observation
IWATE UNIVERSITI	ATTENDED ANNUAL MEETING OF JAPANESE SOCIETY FOR VETERINARY
	MEDICINE.
HOKKAIDO UNIVERSITI	FACULTY OF VETERINARY MEDICINE, LABORATORY FACILITIES.
ABURAHI LABORATORY	LABORATORY FACILITIES SUCH AS RADIO-ISOTOPE RESTRICTED
SHIONOGI Pharmaceutical	LABORATORY AND THE SOPHISTICATED MACHINE TO CHECK R.I.
COMPANY, NIAH, GIFU.	CONTAMINATION.
CENTRAL LABORATORY	FACILITIES FOR VACCINE PRODUCTION, EXPERIMENTAL ANIMAL
KYORITSU SHOJI,	HOUSE.
TSUKUBA.	
NIAH, TSUKUBA.	VIEWING OF VIDEO TAPE OF NIAH GENERAL SET UP AND
	FUNCTIONS.

6 Suggestions or Comments for Training (besides the "Final Report")

SOME KNOWLEDGE AND THE ABILITY TO SPEAK THE JAPANESE LANGUAGE IS BENEFICIAL AND IT COULD HELP THE PARTICIPANT TO INTERACT BETTER WITH THE STAFF OF THE TRAINING INSTITUTE.

ANNUAL REPORT FROM BACTERIOLOGY

This section was very busy with field surveys throughout the first half of the year. Three surveys on the prevalence and incidence of infectious coryza was carried out during this period. In January, a survey was carried out in 9 Selangor farms. Sinus swabs and blood samples were collected. Sinus swabs were directly inoculated onto chicken meat infusion agar while the blood was subjected to separation for serum. Hemeagglutination Inhibition (HI) Test was carried out from the serum collected to check against Haemophilus paragallinarum(Hpg) serotype A and C. No Hpg was isolated, however, 1 serum sample had a positive titre for infectious coryza.

In March, another survey was carried out in Johore Bahru. Out of the 100 sinus sample, 3 samples from 1 farm was found to be positive with Hpg. They are of serotype A. However, only 1 sample was found to have titres with infectious coryza.

In between the surveys, antigens of isolates obtained in 1988 were prepared and run through SDS-PAGE electrophoresis to study the antigens of Hpg. However, several attempts of electrophoresis of Hpg was carried out, no conclusion have been made. This may be due to lack in knowledge about the antigenicity of the Hpg.

In May, the pathogenicity of H.avium isolated in 1988 with Japanese expert Dr. Iritani was studied. Chickens aged 6 weeks were inoculated with 10^8 cfu of organisms. After 4 weeks, the chickens were sacrified and organism reisolated. The chickens did not give any clinical symptoms and no organism were reisolated. This therefore, proves that H.avium is not pathogenic, H.avium antigen was also run through SDS-PAGE electrophoresis along with the reference H.avium brought by the expert and was found that the H.avium isolated in Malaysia have then same number of bands as in the reference strain.

In late May and early June, this section is again busy in training laboratory assistants from other regional laboratories on 'Isolation and Identification of H.paragallinarum' Five laboratory assistants engaging in bacteriology section participated in this 1 week course which consisted mainly on practical aspects.

From the 5th June till 17th June, I undergo a short course on 'Applied Statistics in Animal Production Research' in the Universiti Pertanian.

Another H.paragallinarum survey was carried out in Pahang and Trengganu. 8 farms were visited where 108 samples were collected. No Hpg were isolated in Pahang but in Trengganu the serum samples were found to have some titres to the HI test. These titers are attributed to the infectious coryza vaccine vaccinated earlier.

Miss Siti Zaleha, laboratory assistant was transfered on the 15th of August to a regional laboratory in Johore Bahru. She is being replaced by Mrs. Tan Lin Jee.

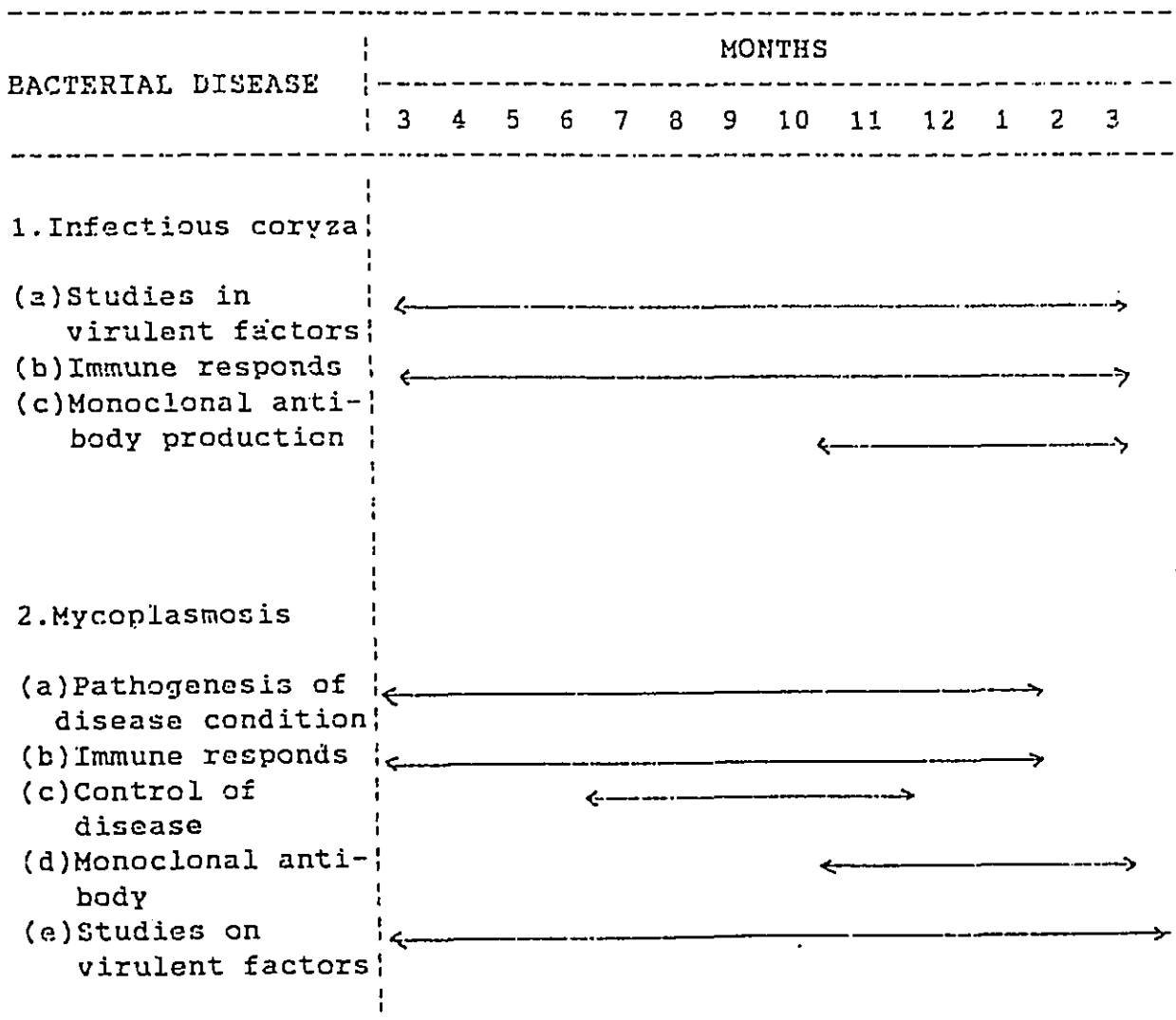
In early July, 30 day old chicks were kept in an isolator in the Experiment Chicken House for an experiment to test the efficacy of an infectious coryza vaccine. However, just a few days before the administration of the vaccine, all the chickens died due to suffocation. There was an electric trip which failed to supply air into the isolator. However, the experiment is still continuing in another ordinary chicken room.

Besides research, this section is also responsible to monitor SPF chickens against bacterial contamination such as Mycoplasma gallisepticum, Mycoplasma synoviae, Salmonella Pullorum and Haemophilus paragallinarum.

In late September, a short term expert, Dr. K. Yamamoto had taught us many techniques on several subjects such as:

1. Preparation of culture media for mycoplasmas
2. Procedures for isolation and purification of mycoplasmas
3. Preparation of antigens for immunization and serological tests
4. Procedures for immunization
5. Serological procedures for identification of mycoplasmas 1)Metabolic inhibition test
   2)Growth inhibition test.

WORKPLAN OF BACTERIOLOGY SECTION FOR 1990/91



SCIENTIFIC / TECHNICAL REPORT / PAPER LIST FROM BACTERIOLOGY SECTION

1. 'Isolation and Identification of Haemophilus paragallinarum from Poultry' in Jurnal Sekolah Teknologi Makmal Veterinar, Vol. 5, No. 1, 1988.

2. 'Isolation of H. avium from a Malaysian Poultry Farm'. (submitted to publisher of Jurnal Veterinar Malaysia).

3. 'Serotyping of H.paragallinarum by the dot- blotting technique', presented at the 1st Congress of the Veterinary Asssociation of Malaysia held in Kuala Lumpur in March 10 - 12, 1989. Also appeared in 'Animal Industry in Malaysia and the Veterinary Profession', proceedings of the first congress Veterinary Association Malaysia.

4. 'Serotyping of H.paragallinarum isolated in Malaysia'.

5. 'An evaluation of suitable media for the growth of H.paragallinarum'.

6 'Characterization of 6 H.paragallinarum isolates of Malaysia'.

ASSIGNMENT OF JAPANESE EXPERTS

Request for three man-months of expert in:

1) Mycoplasmas

   a) Western and Southern blotting of Mycoplasma antigen

   b) Immune response

   c) DNA extraction and use of DNA.

2) Infectious Coryza

   a) DNA extraction and gene cloning

   b) Technique of deoxyribonucleic acid (DNA)- DNA hybridization of Haemophilus sp.

   c) Western and Southern blotting of Haemophilus paragallinarum

   d) Purification of H.paragallinarum.

COUNTERPART TRAINING IN JAPAN

Candidate: Mrs. Tan Lin Jee

Position: Laboratory assistant

Training Program Request:

1) Immune response of chickens against M.gallisepticum and M.synoviae.

2) Preparation of stained antigen of M.gallisepticum and M.synoviae

Suggested Place: Nesseiken Co.

EP I

Annual Report 1989 Of The Avian Epidemiology Section :

Between January - February 1989, the activities were geared to the preparation for the official opening of the APDRTC. There was work on desktop publishing done and other preparations. Subsequent to the above activities, the officer-in-charge of the unit had to prepare himself for his Masters Programme and was scheduled to depart in August ,1989.

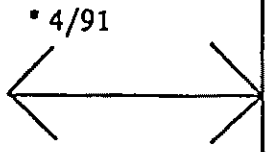
In spite of this, between March - December 1989 the Epidemiology section has been able to support other sections of the APDRTC in collating and processing data for publications, scientific reports and seminars.

In order to overcome anticipated problems resulting from the departure of the Unit Head, a new officer was assigned to the Avian Epidemiology section on the 10th August, 1989. This was intended as a relief measure to tide over the period of absence of the unit head. This period is expected to extend until the return of the officer - April ,1991. As a futher relief measure , an additional laboratory assistant was assigned to the unit on a full time basis.

However the new officer is not a trained Avian Epidemiologist and transfer of knowledge between the Unit Head and the replacements was not possible due to the limited overlap time.

Hence most of the activities planned to be undertaken in 1989 could not be carried out fully. These covered four broad areas related to field surveys , laboratory , research , and training activities .

WORKPLAN OF THE PROGRAMMES OF THE EPIDEMIOLOGY UNIT (APDRTC)

PROGRAMME ITEMS	YEAR	
	1990	1991
1 Assist in suportive services to the other laboratory sections (APDRTC) in terms of data collation and publication preparation		
2 To collabrate with other laboratory sections of APDRTC especially in the field survey of a research programme or project (Epidemiological studies in the field)		

Note:

intermittent involvement due to commitments of service examination , upgrading of Laboratory Information System and management of Databank.

Scientific / Technical Report / Paper List

The technical reports which have been published from the epidemiology section are as follows :

1 Some observations on market and slaughter-house in Ipoh , Malaysia (1987)

2 Final report on Epidemiological Study of chicken diseases in the states of Perak and Kelantan (1987)

3 Report of the field trips to Regional Veterinary Diagnostic Laboratories and poultry farms (1988)

Annual Report 89

Unit SPF

The SPF Unit of the APDRTC started operation in September 1988 with the arrival of a short-term Japanese expert and 400 SPF eggs from Nippon Institute of Biological Science, granted by Japan on 1st September, 1988.

The activities of the SPF Unit went on smoothly through out 1989, though there were some hitches initially with reference to the SPF monitoring and it's results. On the whole it has been a very fruitful year for the SPF Unit. The following gives an insight into the activities of the Unit.

I. Activities

1. Setting up of the 1st and 2nd Batch (Parent Stock) of SPF Poultry Flock

The 1st batch of 400 apparent fertile SPF eggs from Nippon Institute of Biological Science was set for incubation on the 6/9/88 and hatched on the 28/9/88.

The fertility percentage of the imported eggs was 92.73 with a hatchability of 77.99% (Table 1). The hatchability was a little lower than expected becaluse of the high incidence of hatch-failed eggs. Out

of 80 unhatched eggs. 66 were dead embryo, dead after 12 days of incubation.

The 2nd batch of 400 eggs from the same Institute was set for incubation on the 25/8/89 and hatched on the 16/9/89. The fertility of the eggs was 80.8% and hatchability 75.9% (Table 2). We are currently raising 230 healthy chicks. The average body weight of new born chicks was 37 grs. and subsequent average weight of chicks up till 10 weeks are as shown (Table 3. Fig 1).

The 1st selection for breeding of the 2nd batch of SPF chicks was carried out on the 16 October 1989 with a selection of 89 male and 111 females respectively with the male averaging 373.45 grs. and famale 320.5 grs in weight.

2. Results of 1st Batch SPF Parent Stock

(i) Rate of raising and first egg production

Table 4 shows the rate of raising, livability and age in days of first egg production and 50% egg production of the 1st batch of SPF parent stock.

The 1st selection was made at 30 days to select 100 male and 100 females. The rate of raising was 98% due to blood collection. The age of first egg production was 143 days old and 50% egg production was at 183 days old.

(ii) Movement of Egg Production Ratio and Livability

Table 5 and fig. 2 shows the movement of egg production ratio and livability of parent stock flock from 20 to 65 weeks old.

The laying percentage reach over 80% at 28 weeks old. It stayed at that level of percentage until 38 weeks of age and then decreased with the ageing. Through this period the livability of the male and female were 100% and 80.88% respectively.

(iii) Fertility and Hatchability of eggs produced

Artificial Insemination (AI) for the production of fertile eggs have been done twice a week on Tuesday and Saturday. The average fertility was 91.72% and the average hatchability was 78.5% (Table 6).

Fertility is found to be high but the hatchability is just average. The hatchability percentage is based on 9 hatchings carried out by the Unit. Table 7 shows the fertility and hatchability of produced SPF eggs and eggs supplied to the laboratory, APDRTC. The fertility rate is rather high.

(iv) Production and supply of eggs

Table 8 shows the number of production and supply of SPF eggs. Currently, the regular consumption of SPF eggs is 180 per week, 60 for

APDRTC and 120 for VRI. The average percentage of consumed eggs for the year is 58.02%.

The apparent cost of producing one SPF egg at the APDRTC is M$ 13.80. It is hope that the future utilization of these valuable SPF eggs will increase.

(v) SPF Flock Health Monitoring

5 regular monitoring have been done at fixed intervals. 19 types of pathogen, 13 viruses, 2 bacteria, 2 mycoplasma and 2 protozoa,were examined. The flock was not contaminated.

II. Production and Supply of pellet feed to SPF Poultry Flock

The SPF feed is produced 2 to 3 times a week, due to the autoclave capacity, FMH can produce 30kg of feed per round and can go through 3 rounds to produce 90 kg. perday. The record of feed production is shown in table 9.

TABLE 1

Fertility and hatchability of SPF Line-M chickens imported from Japan

Date of incubation	No. of egg set	No. of unfertilized eggs	No. of fertile eggs	Percentage of fertility	Embryonic death during incubation period	No. of newly hatched chicks		
						Total chicks	Culled chicks	Healthy chicks
Sept.6 '88	399	29	370*1	92.73	80(66)*2	287	29	258

Hatchability of fertile eggs	Percentage of healthy chicks
77.99	89.89

*1 This number contain 2 eggs which were used for tissue culture and 1 broken egg

*2 Figures in parentheses indicate number of embryonic death occurred in 18 to 22 days of incubation

TABLE 2

Fertility and hatchability of SPF Line-M chickens imported from Japan

Date of incubation	No. of egg set	No. of unfertilized eggs	No. of fertile eggs	Percentage of fertility	Embryonic death during inculation period	No. of newly hatched chicks: Total chicks	Culled chicks	Healthy chicks
Sept. 16 '89	400	77	323	80.75	78(58)	245	6	239

Hatchability of fertile eggs	Percentage of healthy chicks
75.85	97.55

* Figures in parenthesis indicate number of embryonic death occurred in 18 to 22 days of incubation.

TABLE 3

BODYWEIGHT OF SPF CHICKENS (LINE-M STRAIN)

CHICKES RAISED IN	GENDER	AGE IN WEEKS	0	1	2	3	4	5	6	7	8	9	10
APDRTC	MALE		37	80+6	151+8	235+11	352+32	442+31	550+43	652+41	795+63	941+83	1090+64
	FEMALE				134+6	225+17	304+24	386+20	479+30	540+28	646+31	732+29	829+42
JAPAN	MALE		40+1	84+11	152+21	245+23	364+35	493+42	665+55	803+58	955+72	1095+8	1175+84
	FEMALE			75+12	125+17	219+19	310+25	402+47	518+37	721+55	724+69	826+53	904+92

APDRTC : Observation Conducted in September to November 1989.

JAPAN : Nisseiken Co; Ltd. 1988.

Fig 1. Curve of Body Weight Gain of SPF Chickens (Line-m)

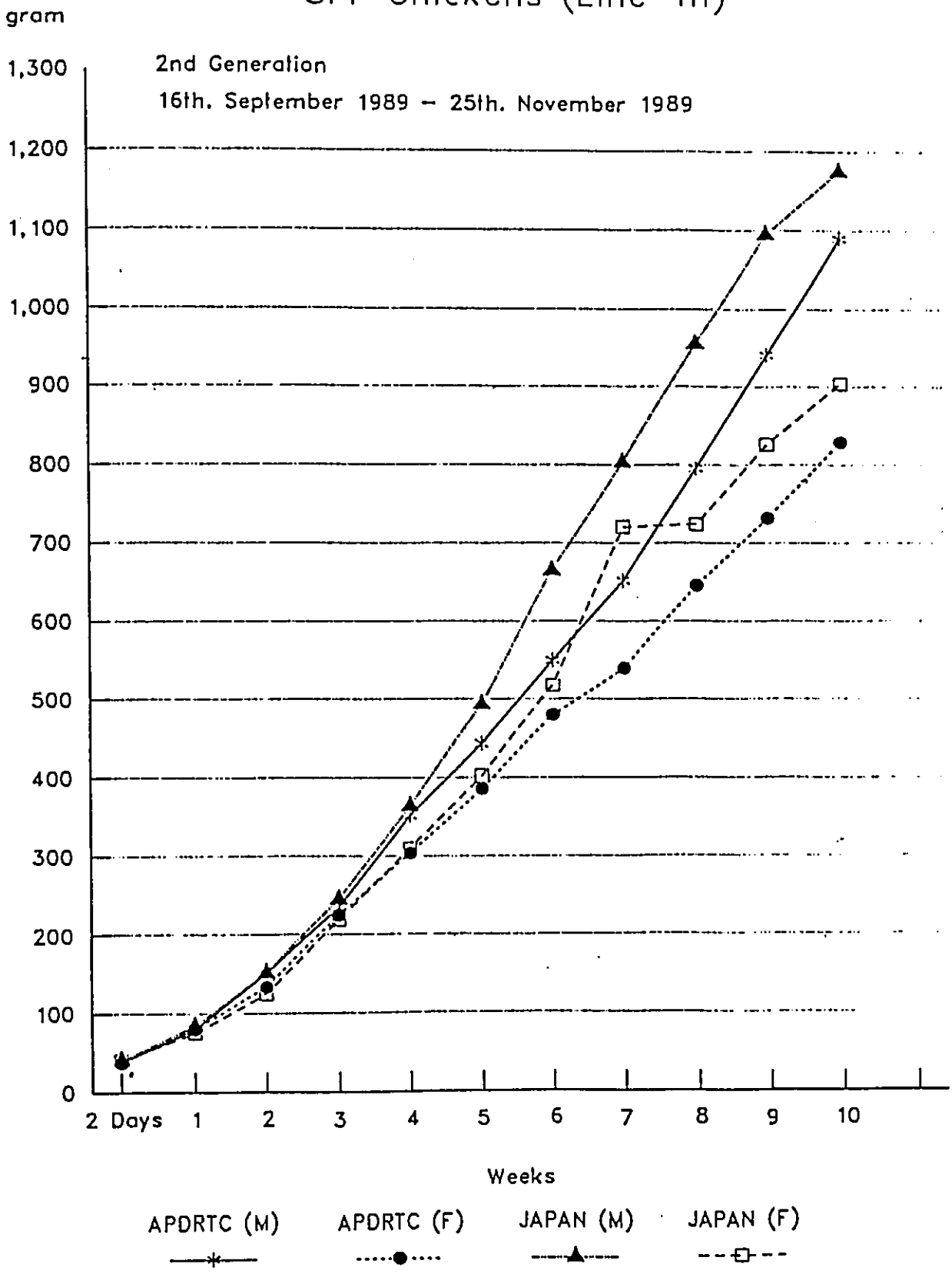


TABLE 4

NUMBER OF SPF CHICKENS MEASURED, LIVABILITY, AGE IN DAYS OF FIRST EGG LAID AND 50% EGG PRODUCTION

Generation 1st. Date of Hatching	Total 1st. Selection	Number 2nd. Selection	3rd. Selection	Rate of raising %	Livability 2nd.	3rd.	Age in Days 1st Egg Laid	Age in Days 50% Egg Production
28/9/1988	Male	100	80	99	93.75	100		
	Female	100	84	97	94.05	92.65		
	Total	200	88	98	93.90	94.32	143	183

1. Day-old to the commencement of egg production
2. 1)
   3) died after first SPF monitoring (Bled from the heart).
3. 1 died 4) culled for suspected ALV
   4)
4. 3 died 2 Culled for suspected ALV.

TABLE 5

LAYING PERFORMANCE
OF
FIRST BATCH OF SPF CHICKEN

AGE IN WEEKS	No. OFF EGGS	No. OFF HEN	LAYING %
20	1	68 X 2=136	0.73
21	6	68 X 7=476	1.26
22	25	68 X 7=476	5.25
23	65	68 X 7=476	13.65
24	114	68 X 7=476	23.95
25	192	68 X 7=476	40.34
26	266	68 X 7=476	55.88
27	334	68 X 7=476	70.17
28	384	68 X 7=476	80.67
29	392	68 X 7=476	82.35
30	381	68 X 7=476	80.55
31	392	68 X 7=476	82.35
32	398	68 X 7=476	83.51
33	372	68 X 7=476	78.15
34	386	68 X 7=476	81.09
35	381	68 X 7=476	80.04
36	384	68 X 7=476	80.67
37	388	68 X 7=476	81.51
38	381	68 X 4=}	
		67 X 3=}473	80.55
39	367	67 X 7=469	78.25
41	351	67 X 7=469	74.84
42	345	67 X 7=469	73.56
43	352	67 X 7=469	75.05
44	337	67 X 7=469	71.86
45	320	67 X 7=469	69.10
46	309	67 X 4=}	
		65 x 3=}643	67.91
47	299	65 x 7=455	64.62
49	297	65 x 7=455	65.70
50	279	65 x 7=455	62.69
		65 x 4=}	
		64 x 3=}452	
		64 x 4=}	
		63 x 3=}445	
51	284	63 x 7=441	64.40
52	237	63 x 1)	
		63 x 6)=435	54.48
53	241	62 x 7=434	55.52
54	230	62 x 7=434	53.00
55	212	62 x 7=434	48.85
56	203	61 x 7=427	47.31
57	174	61 x 5=)	
		60 x 1=)	
		59 x 1=)425	40.94

AGE IN WEEKS	No. OFF EGGS	No. OFF HEN	LAYING %
58	175	59 x 7=413	42.37
59	165	59 x 7=413	39.99
60	178	59 x 7=413	43.10
61	165	59 x 7=413	39.95
62	161	59 x 7=413	38.98
63	180	59 x 1=) 58 x 6=)407	44.23
64	203	58 x 4=) 57 x 3=)403	50.37
65	192	57 x 5=) 56 x 1=) 55 x 1=)396	48.48

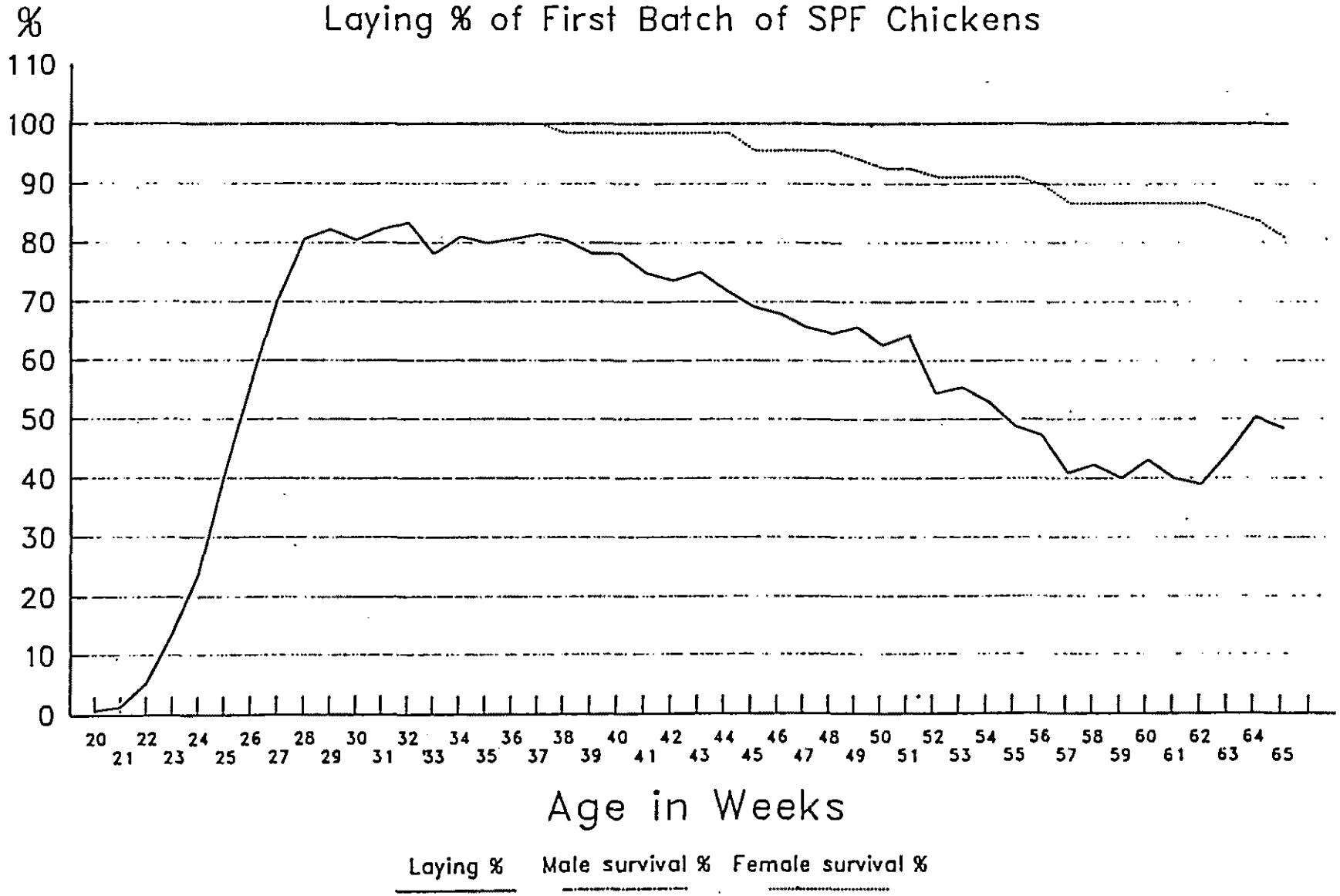

Laying % of First Batch of SPF Chickens
%
110
100
90
80
70
60
50
40
30
20
10
0
20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65
Age in Weeks
Laying %
Male survival %
Female survival %

TABLE 6

FERTILITY & HATCHABILITY OF SPF CHICKEN EGGS PRODUCED AT APORT CENTRE 25/3/89 - 31/12/89

	FERTILITY (%)(1)			HATCHABILITY (%)(2)
FIRST BATCH	3632/3960	91.72	449/572	78.50(3)

1. No. of fertilized eggs/No. of incubated eggs x 100
2. No. of Hatching Eggs/No. of fertilized Eggs x 100
3. Average Hatchability of 9 batchs of SPF Eggs.

TABLE 7.

FERTILITY AND HATCHABILITY OF SPF EGGS AND EGGS SUPPLIED TO THE LABORATORY, APDATC (6/9/88-2/10/89)

INCUBATION DATE	HATCHING CANDLING DATE	TOTAL EGG SET	INFERTILE EGGS	FERTILE EGGS	FERTILITY %	DEAD 1st CANDLING	EMBRYO 2nd CANDLING	DEAD EMBRYO %	ACCIDENT EGGS	TOTAL IN HATCHER	UNHATCH EGGS	WEAK CHICK	HEALTHY CHICK	HATCHABILITY %	REMARKS
*6/9/89	22/9/89	399	29	370	93	12	2	4	2	356	63	29	264	79.19	*Nisseiken
25/3/89	29/3/89	20	9	11	55	-	-	-	-	-	-	-	-	-	Viro Test
28/3/89	3/4/89	60	10	50	83.33	7	-	14	-	-	-	-	-	-	"
3/4/89	7/4/89	80	30	50	62.5	10	-	20	-	-	-	-	-	-	"
3/4/89	10/4/89	60	18	42	70	4	-	9.52	-	-	-	-	-	-	"
4/4/89	10/4/89	60	9	51	85	6	-	11.77	-	-	-	-	-	-	"
10/4/89	17/4/89	90	9	81	90	-	-	-	-	-	-	-	-	-	Vaccine Test
11/4/89	17/4/89	60	10	50	83.33	4	-	8	-	-	-	-	-	-	Viro Test
18/4/89	25/4/89	60	5	55	91.67	3	-	5.45	-	-	-	-	-	-	"
25/4/89	2/5/89	60	5	55	91.67	-	-	-	-	-	-	-	-	-	"
2/5/89	24/5/89	60	7	53	88.33	6	-	11.32	-	47	25	-	22	41.50	Avian Viro
3/5/89	10/5/89	60	6	54	90	2	-	3.70	-	-	-	-	-	-	Viro Test
5/5/89	10/5/89	70	15	55	78.57	-	-	-	-	-	-	-	-	-	"
16/5/89	22/5/89	60	3	57	95	-	-	-	-	-	-	-	-	-	"
23/5/89	29/5/89	60	5	55	91.67	2	-	3.63	-	-	-	-	-	-	"
30/5/89	5/6/89	60	2	58	96.67	2	-	3.43	-	-	-	-	-	-	"

INCUBATION DATE	HATCHING CANDLING DATE	TOTAL EGG SET	INFERTILE EGGS	FERTILE EGGS	FERTILITY %	DEAD 1st CANDLING	EMBRYO 2nd CANDLING	DEAD EMBRYO %	ACCIDENT EGGS	TOTAL IN HATCHER	UNHATCH EGGS	WEAK CHICK	HEALTHY CHICK	HATCHABILTTY %	REMARKS
6/6/89	12/6/89	60	2	58	96.67	2	-	3.43	-	-	-	-	-	-	*
10/6/89	2/7/89	110	4	106	96.36	3	-	2.83	-	103	15	-	88	83.02	*
13/6/89	20/6/89	60	1	59	98.33	1	-	1.69	-	-	-	-	-	-	*
17/6/89	23/6/89	212	10	202	95.28	8	-	3.96	-	-	-	-	-	-	*
20/6/89	26/6/89	60	2	58	96.67	2	-	3.45	-	-	-	-	-	-	*
27/6/89	3/7/89	60	7	53	88.53	-	-	-	-	-	-	-	-	-	*
3/7/89	10/7/89	60	4	56	93.33	-	-	-	-	-	-	-	-	-	*
7/7/89	13/7/89	130	7	123	94.62	-	-	-	-	-	-	-	-	-	*
11/7/89	17/7/89	60	4	56	93.33	-	-	-	-	-	-	-	-	-	*
18/7/89	24/7/89	60	6	54	90	3	-	5.56	-	-	-	-	-	-	*
25/7/89	31/7/89	60	2	58	96.67	3	-	5.17	-	-	-	-	-	-	*
26/7/89	31/7/89	50	1	49	98	2	-	4.08	-	-	-	-	-	-	*
1/8/89	8/8/89	60	5	55	91.66	1	-	1.81	-	-	-	-	-	-	*
2/8/89	9/8/89	140	5	135	96.43	3	-	2.22	-	135	24	-	111	82.22	*
8/8/89	14/8/89	60	7	53	88.33	1	-	1.88	-	-	-	-	-	-	*
15/8/89	21/8/89	60	2	58	96.67	6	-	10.34	-	-	-	-	-	-	*
17/8/89	23/8/89	150	5	145	96.67	5	-	3.45	-	-	-	-	-	-	*
22/8/89	28/8/89	60	4	56	93.33	1	-	1.79	-	-	-	-	-	-	*
25/8/89	16/9/89	400	77	323	80.75	13	7	6.19	-	303	58	6	239	75.85	* Nisseiken
29/8/89	4/9/89	60	1	59	98.33	2	-	3.39	-	-	-	-	-	-	Viro test
5/9/89	11/9/89	60	0	60	100	3	-	5	-	-	-	-	-	-	*
12/9/89	18/9/89	60	1	59	98.33	1	-	1.69	-	-	-	-	-	-	*

INCUBATION DATE	HATCHING CANDLING DATE	TOTAL EGG SET	INFERTILE EGGS	FERTILE EGGS	FERTILITY %	DEAD EMBRYO CANDLING 1st	DEAD EMBRYO CANDLING 2nd	DEAD EMBRYO %	ACCIDENT EGGS	TOTAL IN HATCHER	UNHATCH EGGS	WEAK CHICK	HEALTHY CHICK	HATCHABILITY %	REMARKS
19/9/89	25/9/89	60	2	58	96.67	3	-	5.17	-	-	-	-	-	-	
26/9/89	2/10/89	60	4	56	93.33	1	-	1.78	-	-	-	-	-	-	
3/10/89	9/10/89	60	2	58	96.67	3	-	5.17	-	-	-	-	-	-	
10/10/89	16/10/89	60	3	57	95	3	-	5.26	-	-	-	-	-	-	
6/10/89	27/10/89	70	3	67	95.71	1	-	1.49	-	66	10	4	52	83.58	Para test
11/10/89	1/11/89	70	8	62	88.57	1	-	1.61	-	61	10	-	51	83.19	Bact test
17/10/89	23/10/89	60	8	52	86.67	2	-	3.85	-	-	-	-	-	-	Viro test
24/10/89	30/10/89	60	8	52	86.67	2	-	3.85	-	-	-	-	-	-	
20/10/89	10/11/89	60	7	53	88.33	3	1	7.55	-	49	6	-	43	81.10	
31/10/89	6/11/89	60	3	57	95	1	-	1.70	-	-	-	-	-	-	
3/11/89	25/11/89	56	7	49	87.64	2	1	6.12	-	46	7	-	39	79.59	
7/11/89	13/11/89	60	2	58	96.67	3	-	5.66	-	-	-	-	-	-	
14/11/89	20/11/89	60	5	55	91.67	2	-	3.64	-	-	-	-	-	-	
18/11/89	24/11/89	70	8	62	88.57	1	-	1.61	-	-	-	-	-	-	Patho test
21/11/89	27/11/89	60	4	56	93.33	1	-	1.79	-	-	-	-	-	-	Viro test
28/11/89	4/12/89	60	2	58	96.67	1	-	1.72	-	-	-	-	-	-	
27/11/89	18/12/89	30	-	30	100	2	-	6.67	-	28	4	1	23	85.71	
29/11/89	21/12/89	22	5	17	77.27	-	-	-	-	17	2	-	15	88.23	
5/12/89	11/12/89	60	3	57	95	4	-	7.01	-	-	-	-	-	-	
12/12/89	18/12/89	60	6	54	90	1	-	1.85	-	-	-	-	-	-	
19/12/89	26/12/89	60	3	57	95	2	-	3.51	-	-	-	-	-	-	
23/12/89	13/1/90	70	2	68	97.14	1	2	4.41	-	65					
25/12/89	15/1/90	60	7	53	88.33	1	-	1.89	-	52					Para test
26/12/89	2/1/90	60	5	55	91.67	2	-	3.63	-	-	-	-	-	-	Viro test

TABLE 3

PRODUCTION & SUPPLY OF SPF CHICKEN EGG 1989

	Jan	Feb	Mac	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Egg Production	-	18	563	1579	1716	1626	1571	1381	583	969	732	807	11,545
Supply to Lab	-	-	80	550	650	1080	870	1140	360	780	760	420	6,698
Percentage (%)	-	-	14.2	34.8	37.9	66.4	55.4	82.6	61,2	80.49	103.83	52.05	58.02

TABLE 9

FEED CONSUMPTION FOR SPF CHICKEN, LABORATORY AND OTHERS

SUPPLIED TO	TYPE OF FEED	MONTH YEAR	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPT.	OCT.	NOV.	DEC.	TOTAL
SPF CHICKEN HOUSE	STARTER (0-4 weeks)	1988									₤200				₤200
		1989									200.2	83.94	125.94		410.08
	GROWER I (4-10 weeks)	1988										122.75	326.2		458.95
		1989										187.25	388.34		575.59
	GROWER II (10-22 weeks	1988													
		1989	613.1	78									156.20	347.85	1,195.15
	LAYERS (22 weeks >)	1988													
		1989		161.5	611.7	210.6	376.2	432.15	252.2	263.55	408.06	160.2 .	263.39	159.25	3,,298.45
EXPERIMENTAL CHICKEN HOUSE	STARTER (0-4 weeks)	1988							5.65		36.9	13	25		80.55
		1989	40				5	20		18.8	28.48	66.7	68.3		247.28
	GROWER I (4-10 weeks)	1988										27	64		91
		1989	50				10		30	85.25		51	80.7	63	369.95
	LAYERS (22 weeks >)	1988													
		1989											60		60
OTHERS	STARTER (0-4 weeks)	1988													
		1989							20	42.2	130				192.2

JICA