

POULTRY RESEARCH ADVISORY COMMITTEE

APPLICATION FOR FUNDS 1983/84

PRELIMINARY PROPOSAL FOR A NEW PROJECT.

1. Title of Project: The influence of chromium and other trace elements on albumen quality of fresh and stored eggs.
2. Controlling Unit: Animal Research Institute, Werribee.
3. Objective:
 1. To study the effect of dietary chromium magnesium, iron and zinc on albumen quality of fresh and stored eggs and other production characteristics.
 2. To determine the interactions between strain and dietary trace elements on albumen quality.

4. Background Information:

Recently there has been a marked decrease in albumen quality of eggs. This could be due to the effects of either genetic or environmental factors. Dietary factors most likely to affect albumen quality are trace elements, particularly chromium, magnesium, iron and zinc.

In general, there is a decline in the albumen quality of eggs as the laying cycle progresses. In addition, there is a progressive breakdown of the thick albumen into thin albumen during storage of eggs. The decline in albumen quality during the latter part of the laying cycle could be partly attributed to the increase in egg size which is negatively correlated with albumen quality. It could also be due to a reduction in the synthesis of albumen in the oviduct. As egg albumen consists mainly of protein (91% of total solids) and inorganic elements (4.3%), it is conceivable that a decline in the absorption of trace elements due to the aging of the hen could reduce the synthesis of albumen in the oviduct. An inadequacy of trace elements required for protein synthesis would lower albumen quality of eggs.

Furthermore, a recent study has shown that eggs from hens fed on a diet supplemented with magnesium deteriorated less rapidly during storage than the eggs from hens given an unsupplemented diet. There are other reports indicating that chromium and trace mineral premixes containing iron and zinc could improve albumen quality of eggs.

5. Research Plan:

Two laying hen experiments, each 12 months in duration, will be carried out. The first experiment will be designed to determine the effects of varying dietary levels of chromium, magnesium, iron and zinc, both singly and in combinations, on albumen quality and other egg production characteristics.

In the second experiment, the interactions between genotypes and dietary trace elements will be studied.

The albumen quality of eggs from various dietary treatments will be measured on the day after the eggs are laid and after 21 or 42 days of storage at 15°C.

The chemical composition of albumen and egg shells will be measured at the start, middle and end of the experiment.

Daily egg production, feed consumption, egg weight, mortality and egg shell quality will also be measured throughout the experiment.

6. <u>Costs:</u>	<u>1983/84</u>	<u>1984/85</u>
Wages	\$1,500	\$1,650
Operating	10,000	11,000
Capital	<u>2,500</u>	<u>800</u>
Total:	<u>\$14,500</u>	<u>\$13,450</u>

7. Staff involved:

H. Karunajeewa, Research Scientist.

S. Abu-Serewa, M.Sc. Senior Livestock Research Officer,

M. Fox, M.Sc. Senior Chemist,

B.E. Bartlett, Senior Livestock Research Officer.

S.H. Tham, Chemist.

PRELIMINARY PROPOSAL -
POULTRY RESEARCH ADVISORY COMMITTEE.

1. Title: The effects of age, severity of beak trimming and stocking density on the welfare and performance of laying hens.

Controlling Unit: Animal Research Institute, Werribee.

2. Objectives:

1. To determine the optimum age for beak trimming laying pullets, i.e. to carry out the beak trimming once only and as early as possible during the day old to 18 week period.
2. To study the effects of the severity of beak trimming on bird behaviour and productive performance.
3. To study interactions between beak trimming and stocking density on laying performance.
4. To study the interactions between strain of bird, form of feed and beak trimming as they affect growth and laying performance.

3. Background information:

Of all poultry husbandry practices beak trimming attracts the most serious criticism from the community. There is some justification for this given the widely differing practices used in beak trimming with regard to age of bird, frequency and severity.

Researchers in the U.K. (Wells et al. 1981) have suggested that there was no evidence of any special need to trim beaks in order to control feather pecking and related vices in the cage environment.

This work however, was carried out at a very low light intensity in windowless houses. These conditions are not possible in the majority of Australian laying units.

Also some local poultry farmers believe that beak trimming has been banned in the U.K. This is not so at present but it is conceivable that in an industry in which windowless houses predominate that effective control of cannibalism could be achieved by using low light intensity and in the absence of beak trimming.

The above conditions do not apply in Australia nor are they likely to. Thus, it is essential that a means of beak trimming is used which is effective when done early in the life of the bird and does not require retouching later in the growing period. Such a method would save labour, cause less distress to the bird and more effectively counter emotional

criticism from community groups.

There is insufficient evidence from Australia and overseas to enable us to recommend such a method of beak trimming.

4. Industry Significance:

Losses from cannibalism vary but it is estimated that at least 50% of all adult mortality in Australian laying flocks results directly from cannibalism. A decrease of adult mortality of 5% would result in an increase in income of \$500 in a 1000 bird flock. Also all laying hens housed in cages in Australia are beak trimmed at least twice during the day old to 18 week period. If the beak trimming operation could be carried out once only, this would result in significant savings in costs of labour.

5. Research Plan:

A series of experiments designed to study the effects of beak-trimming at 7 days, 3, 6, 9, 12, 15 and 18 weeks of age on the behaviour and subsequent laying performance of pullets will be carried out. Additional treatments would include severity of beak trimming (i.e. the removal of either 1/3 or 2/3 of the upper mandible), stocking density (987 or 645 cm²/bird), form of diet (mash Vs pellets) and strain of bird.

Behavioural, biochemical and production characteristics will be monitored at regular intervals. All dead and moribund birds will be sent to the V.R.I. for gross and histopathological examination.

6. <u>Cost</u>	<u>1983/84</u>	<u>1984/85</u>	<u>1985/86</u>
	\$	\$	\$
Wages	1,650	1,800	2,000
Operating	9,000	9,900	10,900
Capitol	800	880	960
<u>Total:</u>	<u>11,450</u>	<u>12,580</u>	<u>13,860</u>

7. Staff involved:

R. Evans, Bendigo,
 C. Winfield, A.R.I.
 H. Karunajeewa, A.R.I.
 B.E. Bartleet, A.R.I.
 S.A. Serewa, A.R.I.
 S.H. Tham, A.R.I.
 M. Fox, State Labs.



Australian Council of Egg Producers

163 Clarence Street, Sydney, N. S. W. 2000

telephone: (02) 29-1051

telex: AA 27959

NOTICE OF MEETING

8 October, 1982

Council delegates are advised that the next General Meeting of Council will be held Friday, 8 October, 1982 at the offices of -

The Livestock and Grain Producers' Association
56 - 58 Young Street,
Sydney N.S.W.

commencing at 9.00 a.m.

Agenda Items: To assist in preparation of the agenda in time to permit circulation and consideration by delegates prior to the meeting, it is requested that all agenda items be submitted to the writer for receipt as soon as possible, and no later than September 24.

Attendance: In order to conclude catering arrangements etc. delegates / secretaries are requested to notify the writer of representatives attending.

Accommodation: Requests for accommodation, if required can be made through Carole Andrews (02) 29 1051.

D.L. Dean
Administrative Officer



July 28, 1982

Mr. K. Fitzgibbon,
Secretary,
Commercial Egg Producers' Association of Victoria,
Central Council,
STRATHFIELDSAYE. VIC. 3551.

Dear Mr. Fitzgibbon,

In reference to your letter of July 9 I would be pleased to have officers of the Department assist with maintenance of internal quality and shell quality in eggs.

My officers keep good contact with the Victorian Egg Marketing Board and have already agreed to assist in several ways to overcome problems of poor shell quality and with internal quality.

Firstly the Board has commenced a program of Haugh unit measurement on samples of eggs from all major producers, who are now being regularly advised of their results.

Departmental officers will be available to investigate any particular problems on quality which Board officers cannot handle.

In particular it is proposed to conduct a serological survey in which blood samples are tested and will include many farms with egg quality problems. One aim of the survey will be to establish the possible implication of some poultry viruses in current internal and shell quality problems, such as Infectious Bronchitis, Egg Drop Syndrome and Avian Encephalomyelitis.


In addition, arrangements have been made for the Board to make regular tests to evaluate internal egg quality (Haugh unit test) and of shell quality (shell thickness) on samples of eggs from all entrant flocks in the current 25th Random Sample Laying Test at Burnley Gardens.

The aim will be to further encourage breeders to select for improved egg quality. The Board has offered to make an annual award to the leading entry with respect to egg quality.

The reports of these egg quality tests at the R.S.L.T. will be reported regularly in the R.S.L.T. interim reports published in the Department's 'Poultry Newsletter' and in the Victorian Egg Marketing Board's magazine 'Egg Producer'.

I trust these arrangements will cover your Association's request.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'D.F. Smith', with a small flourish underneath.

(D.F. Smith)
Director-General of Agriculture.