

TECHNICAL NOTES

A NOTE ON EGG QUALITY IN SOUTHERN QUEENSLAND

Investigations were conducted in 1959-60 to appraise the quality of eggs as received and marketed by the Egg Marketing Board operating in South Queensland with the objective of indicating the benefit to be expected from improved handling of eggs prior to marketing.

Random samples of approximately 1,000 eggs graded for internal quality by candling and for weight were taken direct from the grading machines in five sampling periods each of one week spread over 13 months. All First quality sample eggs were broken out on the day of sampling and internal quality measured in Haugh Units. Internal faults were recorded and the eggs regraded according to faults and Haugh Unit value. Samples of Second grade eggs were taken on three occasions and regraded by a check egg grader.

Quality of Eggs Received

A reconstruction of the quality of eggs as received appears in Table 1 together with air temperature data.

There is a tendency for the quality to decline as the temperature rises, but modifying factors occur. For instance, egg quality is much lower in January than in March, despite similar prevailing temperatures, probably because by March many of the hens laying in January would have been replaced by young stock laying eggs of higher quality.

The analysis of Second quality eggs shows the same effect of temperature on quality. The percentage of stale eggs is lowest where the holding temperature is lowest. The high percentage of "other faults" in the January test is attributed largely to an increase in eggs that showed embryonic development due to the high temperature.

TABLE 1

RECONSTRUCTION OF THE QUALITY OF EGGS AS RECEIVED BY THE EGG
MARKETING BOARD

(a) Overall Quality

Test No.	Week Ending	Average Daily Maximum Temperature (°F)	Percentage First Quality	Percentage Second Quality
1	13.viii.59	74.7	82.3	17.7
2	15.i.60	83.0	73.8	26.2
3	11.iii.60	85.4	82.3	17.7
4	15.vii.60	65.2	91.1	8.9
5	30.ix.60	76.5	83.4	16.6

(b) Analysis of Second Quality Eggs

Test No.	Percentage Intake Second Quality	Faults Expressed as a Percentage of All Eggs Received					
		Stale	Cracked	Blood and Meat Spots	Ruptured Membranes	Stained	Other Faults
1	17.7	*	*	*	*	*	*
2	26.2	13.3	7.0	1.5	0.4	1.1	2.9
3	17.7	*	*	*	*	*	*
4	8.9	2.0	4.2	2.0	0.3	0.3	0.1
5	16.6	6.9	6.6	1.8	0.3	0.9	0.1

Faults expressed as a Percentage of Second Quality Eggs

1	17.7	*	*	*	*	*	*
2	26.2	50.8	26.7	5.7	1.5	4.2	11.1
3	17.7	*	*	*	*	*	*
4	8.9	22.5	47.2	22.5	3.4	3.4	1.0
5	16.6	41.6	39.8	10.8	1.8	5.4	0.6

* Not sampled.

Quality of Eggs Marketed

Eggs graded as First quality contained from 3.8 to 17.1 per cent. of Second quality eggs, staleness being the most common fault (Table 2). The accuracy of the graders (Table 3) varied with the quality of the eggs received (Figure 1). The trend towards increased accuracy as the tests progressed could be due to the appointment of a check egg grader after the first test or to extra care being taken by the graders. The accuracy of detecting blood and meat spots by candling was very low (Table 3).

TABLE 2

ESTIMATE OF THE QUALITY OF EGGS MARKETED

Test No.	No. Sampled	Percentage Regraded First Quality	Percentage Regraded Second Quality	Average Haugh Units of 1st Quality Eggs	Faults Expressed as a Percentage of First Quality Eggs			
					Stale	Blood Spots	Meat Spots	Other Faults
1	1069	88.6	11.4	69.4	8.1	1.3	0.9	1.1
2	1019	82.9	17.1	68.2	12.7	0.4	0.9	3.1
3	1002	90.0	10.0	70.4	6.9	0.2	0.3	2.6
4	1000	96.2	3.8	75.5	2.0	0.8	0.9	0.1
5	1000	91.8	8.2	69.3	6.4	0.6	1.1	0.1

TABLE 3

(a) GRADERS' ACCURACY IN CLASSIFYING SECOND QUALITY EGGS

Test No.	Percentage Intake Second Quality	Percentage Graded Second Quality	Percentage Accuracy
1	17.7	7.1	40.1
2	26.2	11.0	42.0
3	17.7	8.6	48.5
4	8.9	5.4	60.6
5	16.6	9.2	55.4

(b) GRADERS' ACCURACY IN DETECTING BLOOD AND MEAT SPOTS

Test No.	Percentage Blood and Meat Spots in all Eggs Received	Percentage Blood and Meat Spots in First Quality Eggs	Percentage Accuracy
1	*	2.34	..
2	1.5	1.3	20.0
3	*	0.5	..
4	2.0	1.7	21.0
5	1.8	1.7	14.4

* Not sampled.

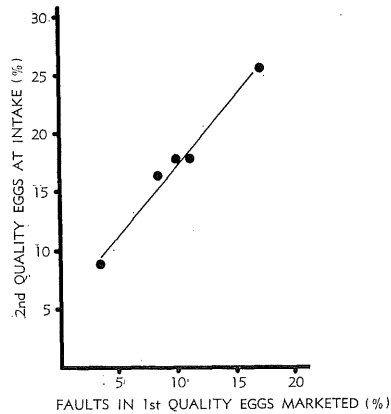


Fig. 1.—Relationship between quality of eggs and accuracy of grading.

Week-end Carryover

Eggs held over from Friday until Monday morning for grading were consistently lower in quality than other First quality eggs, the most common fault being staleness.

Discussion

The tests indicated that South Queensland's subtropical climate is responsible for much deterioration in egg quality, especially in the summer months. Though eggs are normally despatched to retailers within 48 hr of receipt by the Egg Marketing Board, some may be five or six days old by this time and in the summer would have been held for at least portion of the time at an average daily temperature reaching a maximum of 74 to 85°F. Quality is much higher when the holding temperature does not exceed 65°F. As the accuracy of the graders depends largely on the quality of the eggs on receipt, it is even more important that the quality of eggs received for grading be improved by lowering the holding temperature in some way. There is therefore a definite need for air-conditioned egg-holding rooms on farms.

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