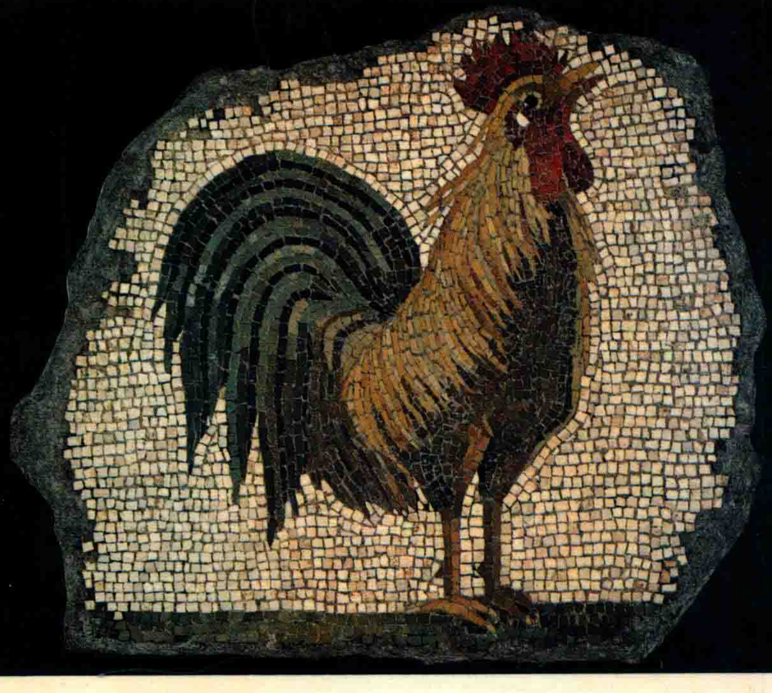
EGG QUALITY– CURRENT PROBLEMS AND RECENT ADVANCES

R G Wells and C G Belyavin

POULTRY SCIENCE SYMPOSIUM
20



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Egg Quality – Current Problems and Recent Advances

Poultry Science Symposium Number Twenty

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Egg quality – current problems and recent advances

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Preface

This volume contains the papers of the 20th Poultry Science Symposium which was held at Harper Adams Agricultural College, Newport, Shropshire on 3–6 September 1985. This series of Symposia is now organised by the United Kingdom Branch of the World's Poultry Science Association. The 20th was run in collaboration with Working Group No. 4 of the European Federation of the Association. Members of the Organising Committee are listed below.

The 20th Symposium was on 'Egg quality—current problems and recent advances' and had four main sections. The first was concerned with the nutritive value of eggs and their dietary significance, including a discussion on the cholesterol issue. This was in response to the increasing interest of consumers in the health aspects of their food. The second section provided a review on egg quality assessment, both in commercial practice and in the laboratory. In section three the biological basis of egg quality was analysed with reference to shell formation and pigmentation, yolk lipid composition and albumen structure. Section four comprised a review of recent developments in the control of egg quality through manipulations of the hen's genetic make-up, laying cycle, physical and climatic environment, nutrition and health status. The emphasis in the last three sections was on work undertaken and reported since 1967 when the fourth Symposium in this series covered a similar field of study under the title 'Egg quality—a study of the hen's egg'.

The 17 chapters of this volume have been written by acknowledged experts in their fields, drawn from Belgium, Canada, France, Israel and the Netherlands as well as from the United Kingdom. They should prove to be of great value to anyone involved in the production, marketing or utilisation of eggs.

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Opening address

Chapter 1

Egg quality—in production, marketing and consumption

K.J. Webb

I hope you all know a little about our great national game, cricket, because in preparing this opening address I imagined myself to be the 'groundsman' helping to ensure that the 'wicket' is provided for the enjoyment of the professionals who are going to play upon it during the next three days. I am even reminded that three days is often not long enough for the result to be conclusive in cricket. At least on this occasion the weather is not likely to intervene, and it is to be hoped that by the close of this Symposium there will be a 'victory' for one point of view or the other. This will ensure that the poultry industry is offered some very definite guidelines for the re-advancement of the egg component within this immensely important food segment of the farming and retailing sectors of the distribution chain; in line with the rapidly changing interests of the ultimate customer—the consumer.

I intend to divide what I wish to say into three non-technical 'ingredients': the subject matter under review; the present state of the UK industry; and the renewal of consumer faith.

The subject matter under review

First of all what about this undefinitive word 'quality'. Of course all dictionaries do give one definition or another, and the English precis often is shown as 'grade of goodness'. 'Goodness' is said to mean 'excellence', which in turn is explained as *'good in high degree'*, and that phrase could probably be accepted as defining quality. But no matter what words are recorded on the subject I believe that for the uninvolved, that is those who are not actively concerned with an authoritative standard, quality is a matter of personal perception. And what is perception? It is defined as the 'reception of a stimulus through the five senses'. These are, of course, sight, taste and touch (the ones we initiate), and hearing and smell (the ones that force themselves upon us).

In any commercial transaction, which includes the simple purchasing of half a dozen eggs in a grocer's shop or the ordering of egg and chips in a restaurant, the perception of 'value', a kind of sixth sense, has a major influence.

So what does 'value' mean? It is defined as 'intrinsic worth or goodness, and the recognition of such worth or goodness'. Therefore whether the purchaser is seeking quality or value it seems that *'goodness'* is the linking perception and, in the case of eggs, the senses in need of stimulation are those of sight, taste and smell. As quality is often considered to be in conflict with quantity, it is also possible that some of the quantity aspirations of egg producers may well constitute a negative from the quality standpoint, unless quality considerations are always given due priority. It is wise therefore that much of the discussion during this Symposium is likely to be concerned with an understanding of that priority.

When I referred to 'those concerned with an authoritative standard' I had in mind the legislators in particular, those who have given the consumer the delight of choosing between seven sizes of egg rather than the restriction of 'large, medium or small' and who have now introduced the opportunity to choose eggs from the 'perchery'! Any connection between the legislator's perception of quality and that of the ultimate consumer is often difficult to appreciate.

Next I would like to comment on the 'production, marketing and consumption' aspects. And I must admit that here, if I am not very careful, I shall be accused of being authoritative, just like those legislators! After a lifetime in what is often loosely called 'marketing', I have begun to consider myself as something of an expert, and experts are rather inclined to be definitive, as some of you may realise! Marketing is not about 'going to market'; nor is it something that can be added in the warehouse, or the retail outlet, after the goods have been produced; nor is it simply concerned with publicity or selling. Rather it is the thought process and means by which business opportunities are searched for and the appropriate actions then taken to profit from those opportunities by making available the chosen products or services. The interaction and interdependence between production, distribution and retailing activities—and the amount to be allocated to publicity—should always be related to a previously agreed marketing strategy.

The basic role of marketing can be equally applicable to branded or non-branded (often called generic) products and it needs to be understood by producers as much as by the distributors or retailers who are usually much closer to the end customer or consumer. All this may sound very academic but it has to be constantly brought to mind in any discussion remotely connected with the farming industry because farmers, who are so patient during the growing or breeding cycles, tend to snatch at short-term sales opportunities with little or no regard to any longer term marketing strategy. And just imagine how wasteful a very short-term attitude can be to any previously well conceived research programme!

So in all that I say from now onwards please accept that I view marketing not as the link between production and consumption but as the overall influence. Please also accept that I am expressing my own views and not any official guidelines from the UK Eggs Authority.

The present state of the UK industry

It might be somewhat extreme to immediately think of emotive words to describe the present state of the UK egg market so I will content myself with 'temporarily in a state of receding standstill'! Egg consumption in the UK has been on an overall downward trend for some years now, although there have been some signs of a halt to this trend in recent times. I do not intend to burden you with too many statistics. However, just to show that eggs have not been suffering on their own perhaps I should quote a few figures illustrating the weekly consumption for a number of staple foods (*see Table 1.1*).

During this same period fruit, potatoes, poultry and fish have remained quite steady and the only example of a comparable food moving in the other direction is

Table 1.1 Weekly consumption per person of some foods (National Food Survey data)

	1980	*1981*	*1982*	*1983*	*1984*
Eggs (No.)	3.69	3.68	3.51	3.53	3.21
Sugar (oz)	11.17	11.08	10.31	9.84	9.15
Liquid milk (pt)	4.10	3.94	3.90	3.71	3.53
Butter (oz)	4.05	3.69	3.17	3.27	2.87
Beef and veal (oz)	8.13	6.96	7.06	6.57	6.27
Bacon and ham (oz)	4.20	4.14	3.95	4.02	3.58

1 oz = 28.35 g; 1 pt = 0.5683 l.

fruit juice. Since 1984 there has been a considerable increase in the written and spoken word in favour of the desirability of 'healthy living'. Many so-called 'fads' in eating habits of recent years are becoming fashionable. You no longer have to be a health food fanatic to adopt a 'healthy eating style' hence, for example, the increase in fruit juice consumption. Furthermore, the housewife is looking more and more for products that will cook easily in her microwave, electric grill, or convection oven (and minimise the chore of cleaning cooking utensils). Coincidentally the large family meal is going out of fashion as each individual in the family unit, including mother, 'does their own thing' and eats what they like when they wish.

Quite apart from these rapidly changing in-home eating habits there are equally important changes taking place all the time in the UK retailing of groceries and cooked food. Already in the 1960s and 1970s there was a move away from customer service in the food retailing sector towards the dominance of a few very large and powerful multiple groups who provide in a variety of forms what is called 'one-stop self service'. The 1980s has seen a further concentration of retail power as the leading groups place a greater emphasis on fresh foods, taking business from most fishmongers, many bakers, and some greengrocers and butchers. Now an alternative method of food shopping is developing which features flexible and convenient opening hours, e.g. '7 to 11' or '8 'til late'. The size of these new convenience outlets limits the range of items on offer, and they tend to concentrate on fast turnover or high margin items. These shops are not so likely to feature many fresh foods as they will not be keen to run the risk of wastage. Even the equally newly developing 'bulk food' stores will tend to avoid the 'run of the mill' fresh foods, although the unusual, such as 'free-range' eggs, may coincide with the image these stores desire. The rise in the number of farm shops and roadside stalls selling fresh home-grown produce may well have peaked and there is some talk about farmers and multiple retailers getting together to establish 'farm-fresh' counters in corners of stores. Obviously this would be an opportunity for eggs to be presented 'naturally' and to attract more attention than they sometimes do in their little boxes!

On the confusing question of packaging styles as they currently exist I can do no better than quote Norman Overfield, the ADAS egg quality specialist, who will be speaking later (*see* Chapter 5) and who wrote earlier this year: 'Twenty years ago egg packs were of little significance to the UK egg industry. Keyes trays and pulp packs of basic structure and design were considered adequate as a means of conveying eggs to the customer. However, when the Egg Marketing Board was disbanded and a free market established everyone from the large packers to the small producer/retailer began to experiment with alternative types of pack in order to strive to achieve an advantage. One large packer has claimed that they were obliged to stock over 500 types of pack at any one time! What other product is presented to the buyer in so many different ways? The present disarray reflects a marketing weakness which needs to be sorted out.' I completely support Norman's concern and I even heard a buyer for one of the top three multiples insist that he had only to ask to be offered any packaging style 'his fancy turned to'. Surely there is need for some objective market research, not to find out new ways of being different, but to discover the ultimate pack style that will both protect and present, with allowable compromise between these two requirements.

Now I wish to direct attention for a few moments to the current state of the UK 'eating out' market. Over the period 1975–81 the average number of meals eaten out/person/week showed an 8% increase and, although since then far fewer meals are eaten out at the place of work or in the schools, the commercial fast-food and pub-food sectors have certainly continued to expand. Both these sectors are potentially excellent markets for eggs and egg products. Hence, the Egg Authority's activities currently include a very comprehensive programme of promotion in the catering trade and, in conjunction with Food from Britain, sponsorship of some research into possible increased usage of eggs in added value foodstuffs.

Before leaving this section, I would like to comment on the present 'state of mind' of that 'average' consumer concerning eggs and the egg industry. Remember that 'state of mind' relates to perception, and perception usually derives from matters that can be perceived to be real. The present generation has grown up in the era, uniquely in the UK, of the brown egg. Eggs are always brown and ideally uniformly brown. To my amazement, one day I watched a lady in a supermarket opening her half a dozen box of eggs and taking from a nearby stack of loose eggs two or three eggs she considered to be more uniformly brown than two or three in the box, and swapping them! Has the industry deceived the consuming public into believing that such uniformity is desirable to the point where they actually perceive the brown egg is also more nutritious? Even though in the beginning the industry may have been attracted to the higher price they might achieve for brown eggs, has all the effort to achieve the perfect brown egg been worth it when the end result is to make all eggs look alike? I cannot see the bread industry giving up the sales advantage of allowing the customer choice between white and brown. Another misconception in the minds of many consumers is that the colour of the yolk is an indicator of nutritional value and a growing misconception is that eggs from free-range hens are always fresher. Consumers also believe that eggs sold from Keyes trays are produced under free-range conditions! And that eggs sold in farm shops are from free-range hens! And what they believe about the relative benefits of size of egg does not bear thinking about! And in any case what should they think? It is confusing enough for them to be faced with making the choice from between the four or five sizes often available in the supermarket where over 25% of all eggs are sold.

Then there are the concerns about battery cages and those frightening words cholesterol and salmonella. So a few favourable words about eggs will not be out of place. They have a lot going for them, with the highest quality food protein which, from a Size 3 egg, contributes 11% of the recommended daily amount of protein accompanied by less than 6% of the maximum intake of fat recommended by COMA (1984). The fat itself has proportionally less saturated fatty acids than the maximum desirable as also recommended by COMA (1984). Then there is the comprehensive range of vitamins and minerals. But if I go on I shall be trespassing on the subject of papers to follow.