



A Case Study of the Introduction of Vegetable Protein into School Meals

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ABSTRACT

The Inner London Education Authority operates 1,070 Schools in the 12 Central Boroughs of London. The Education Act of 1944 imposed on Local Education Authorities a statutory duty to provide school lunches for all maintained Primary and Secondary School pupils who wanted them. In I.L.E.A. schools some 230,000 (65%) children take school meals daily. The Department of Education and Science gives local Authorities detailed advice on the nutritional content of the school meal and how it should be achieved. The last review of these standards was carried out by a Government Working Party in 1975. Concurrently the Food Standards' Committee of the Ministry of Agriculture, Fisheries and Food was reporting on its investigation into Novel Protein Foods. It was these two reports which opened the way to the introduction of Vegetable Protein into school meals. In this paper the Principal Education Catering Organizer for I.L.E.A. discusses how these two reports were implemented in his Authority and describes in detail the program of introduction to brief the 8,000 catering staff involved. Vegetable protein has been incorporated into the I.L.E.A. school meals program since January 1977, and the success of this program is discussed.

INTRODUCTION

The Education Act of 1944 imposed on Local Education Authorities a statutory duty to provide school lunches for all maintained primary and secondary school pupils who wanted them. From time to time, circulars have been issued by the government department responsible for education (now Department of Education and Science) giving advice on the type and nutritional content of the meal which should be provided. The latest Working Party on the Nutritional Aspects of School Meals reported to the Department of Education and Science in 1975.

This Working Party was carrying out its studies concurrently with investigations by the Food Standards' Committee of the Ministry of Agriculture, Fisheries and Food into Novel Protein Foods. This Committee reported late in 1974, and its recommendations in respect to the use of vegetable protein in schools were included briefly as a footnote in the report "Nutrition in Schools."

It was not until early 1976, therefore, that the Inner London Education Authority began to consider the possibility of introducing vegetable protein into the school meals program. What follows is a summary of the discussions, decisions and training which resulted in the Education Catering Branch of ILEA, introducing vegetable protein as a normal constituent of school meals in January 1977.

INITIAL CONSIDERATIONS

The Food Standards' Committee recommended that: (a) vegetable protein food when used as substitute for meat

should be fortified; (b) no more than 10% of the meat in any single meat dish should be substituted by fortified vegetable protein, except that where a menu cycle was being operated, the 10% restriction could apply to the meat content of the whole menu cycle.

Nutrition

It was apparent from earlier discussions with manufacturers that the recommendation by the Committee that vegetable protein used as a substitute for meat should be fortified by the addition of nutrients to an established standard was causing difficulties. It appeared that the addition of 2.6 g methionine per 100 g protein produced an unpalatable result. The question of fortification with methionine was, therefore, referred to the Principal Medical Officer (Nutrition) at the Department of Health and Social Security with the following result: "We do not consider that there is any danger of too little methionine in the diet of the school meal, or any other meal in this country at present. However, when we reported to the Food Standards' Committee we had to think of the future . . ."

Information available made it clear that with the exception of methionine, most brands of vegetable protein, when hydrated, were adequate substitutes for butcher's meat from a nutritional point of view.

Why Introduce Vegetable Protein into School Meals at All?

The Education Catering Service, while it is concerned to introduce to school children the most interesting and varied meals possible within its charter, does not seek to pioneer any dramatic change in social eating habits. However, in view of: (a) the widespread use of soy-based products in the manufactured food industries, (b) the need at that time for school meals to contribute to economies in local government expenditure where this could be done without detriment to the nutritional standard of the meal, and (c) the approval by the Food Standards' Committee of its limited use in school meals, it was apparent that its introduction into the school meals program was justified.

Financial Economies

An analysis of the planned use of butcher's meat in ILEA schools and the projected replacement of 10% of it with vegetable protein, produced the following calculations:

As at 1 March 1976 (from the Shopping List Recommended by DES)	
	lbs.
Butcher's meat element for 2,000 meals	176.9
Total for 50,000,000 meals a year	4,422,500
1/10th replacement	442,250
Recommended dry weight of VP replacement (say 33%)	147,400

As savings would relate to cheaper cuts of meat only,

Meat: 442,240 lbs. at say, 47 p, per lb	£207,858
VP: 147,400 lbs, at say, £2.40 per 5k	£32,160
Potential saving	£175,698 pa

Estimated Requirement for Vegetable Protein

Meat - total annual consumption	2,000 tons
Substitution (reconstituted)	200 tons
Actual dried weight	67 tons per annum

Estimated Rate of VP Substitution in Suitable Meat Dishes

This figure was produced from a detailed analysis of actual meat bills for 1 week from a random selection of 71 establishments.

Total of typical meat bills	8,634 lbs
Meat items unsuitable for substitution	3,128 lbs
Balance	5,506 lbs

$$10\% \text{ of } 8,634 = 863 \frac{4}{10} - 5,506 \times 100 = 15.7\%$$

This then was the rate of substitution we should need to use in all those dishes in which VP could be used.

Publicity

The need for publicity and the extent to which information on the proposal should be disseminated was discussed at length. It was decided: (a) the use of the word "textured" was emotive and should be dropped. Henceforward only the words "vegetable protein" would be used. (b) Every member of the 8,000 school meals staff should understand thoroughly what was contemplated. (c) Vegetable protein is an entirely "natural" food, already extensively used in bakery, processed meat and other "manufactured" foods. In this context a planned publicity program, aimed at teachers and parents or at children, could prove to be counter-productive by highlighting what was no more than the introduction of an alternative foodstuff, and so inviting controversy where it need not exist. General publicity should, therefore, be limited to the normal distribution of Education Committee Minutes of their proceedings.

COMMITTEE APPROVAL

Having completed the initial survey into the proposal, the facts about vegetable protein and the effects of its introduction into the School Meals program were presented to the relevant subcommittee of the ILEA Education Committee for its consideration. The proposal was approved and a program for the introduction of vegetable protein was devised which was to run from early May 1976 until its formal introduction in January 1977. The program was to cover all 1,070 schools in ILEA, less the 42 schools which used frozen food purchased from manufacturers, but including those Jewish schools with strict Kosher diets.

The 40 colleges of Further and Higher Education serving canteen meals to students were also not included for the time being, as it was felt that the use of vegetable protein in items "for sale" would cause complications requiring special control procedures and difficulties in pricing policy.

SELECTING A BRAND OF VEGETABLE PROTEIN

All manufacturers producing vegetable protein were contacted. Samples were assembled and all information relevant to a selection was assembled in a systematic way. At an early stage, it was decided that the most important basis for the final selection was that it should be the most acceptable from a culinary point of view. Only after this criteria had been satisfied would other factors such as price, ease of preparation, sales service, etc., be considered.

An initial elimination took place by putting the brands before a tasting panel to reduce the choice to five brands. At the same time, it was decided to limit further trials of these five brands to their mince and chunks varieties, colored but unflavored. A second tasting panel considered the five selected brands and reduced these to three which were considered acceptable. One of these was later elimin-

ated when the manufacturer concerned agreed that the reconstitution procedure could not be simplified. The remaining two manufacturers were invited to tender for a contract through the Supplies Department.

Formulation of Recipes

Throughout the period of testing, considerable experience was gained in introducing vegetable protein into standard recipes. A new recipe book was concurrently being written. This meant that the procedures for using vegetable protein and the quantities to be used could be incorporated in all the recipes in which substitution of meat by vegetable protein was appropriate. Two other important decisions were made as a result of this practical experience. (1) There is considerable variation in the rehydration rate claimed by various manufacturers. It will be appreciated that in school meals it is important to be certain that the nutritional value of the meat substituted was being replaced as well as its bulk. To achieve this it was determined that vegetable protein should be incorporated in recipes at a presumed rehydration rate of 2:1 regardless of the manufacturers' claims. (I will return to this point again.) (2) It was established that the best results could be achieved if only the "large chunks" variety of VP were used without reconstitution in the following ways: (a) minced meat dishes - mixed dry with the prepared meat and passed through the mincer together; (b) stew meat dishes - mixed dry with the prepared meat and passed through the meat cutting machine together; (c) some selected stew dishes - mixed dry with the diced meat cut by hand, allowed to stand and then fried off together. It was considered that in this way the vegetable protein absorbed the flavors of the meat with which it was combined at an early stage. It had also the merit of simplicity in use. It will be appreciated that in all recipes allowance was made for the extra liquid required.

Nutritional Analysis

Samples of the two suitable brands were forwarded to the Scientific Adviser of the Greater London Council for analysis and confirmation of the information provided by the manufacturers. From this information it was possible by calculation to determine that the protein value of the two varieties most nearly approximated to fresh meat when rehydrated at 2:1. At this time a final cost comparison with fresh meat was made (at a presumed 2:1 rehydration rate) and a final selection made.

TRAINING OF STAFF

The operational staff of Education Catering Branch is organized by divisions to conform to the ten Educational Divisions of ILEA. Each division has a Senior and a Junior Catering Organizer. The 8,000 staff in schools is made up of some 1,500 superintendents, cook supervisors, cooks-in-charge, cooks and 6,500 kitchen assistants (mainly part-time). The following decisions were made to ensure that all staff would be fully briefed by January 1977. (1.) During the week of Autumn half-term each senior organizer would give 10 half-day presentations to her supervisory and cooking staff, i.e., not the kitchen assistants. This meant a total of 100 presentations throughout ILEA during the week concerned. (2.) The Education Catering Branch Training Centre would prepare a module and training pack to cover these presentations for issue to each of the senior organizers. (3.) All catering organizers would themselves be given this module by Training Centre staff and their own suggestions incorporated into the training material. (4.) Twenty Superintendents (two per Division) would spend three days at the Training Centre to be given the above module and to be trained in the practical use of VP in all the newly formulated recipes. It would be their task to sup-

port the SDECO at half-term in preparing dishes to be tasted at the presentations and to answer any practical questions which might arise. (5.) A 20-minute television film would be prepared for transmission on three afternoons in December through the ILEA Education Television network. This means all 6,500 kitchen assistants would be able to receive the main content of the training module by viewing the program in their own schools throughout inner London.

The Module and Training Pack

This consisted of a detailed lesson plan and a series of visual aids as follows: (a) a shopping basket of some 25 items purchased from a local supermarket which contained soy in some form; (b) a large mounted color photograph of a selection of some 10 perishable items sold in the same supermarket which contained soy; (c) a mounted diagram showing the manufacturing processes to produce various products from the soybean; (d) a bag of soybeans; (e) a tin of "soy choice," a meat analog; (f) samples of the selected vegetable protein; (g) a mounted diagram to demonstrate yield of protein per acre for various protein sources; (h) a typical recipe showing substitution rate and enhanced liquid requirement; (i) samples to taste – prepared by superintendents - (i) reconstituted vegetable protein on its own, (ii) two dishes from the new recipe book.

The aim of the lesson plan was: (a) to explain exactly what vegetable protein is, where it comes from, how it is processed; (b) how to use it in a way that will be accepted by children; (c) to conduct the demonstration in such a way as to foster a "climate of acceptability."

"Climate of Acceptability"

This aim which was carried forward to the production

of the television film was to be achieved by emphasizing: (a) vegetable protein is a natural food; (b) it is already widely used in meat, bakery and tinned foods purchased in local supermarkets; (c) financial savings were to be achieved; (d) practical demonstration and tasting.

Practical Experience for Kitchens in the Use of Vegetable Protein

During the second half of the autumn term, each kitchen was issued with a supply of the selected vegetable protein and was encouraged to practice its incorporation in all the newly formulated recipes. Small quantities of the new dishes were to be prepared each day until confidence in using the new food material had been established.

Television Film

As planned, this 20 min. film was planned for the month of December and was sent out on three afternoons to ensure that all staff had the opportunity of seeing it.

Planned Savings

All kitchens were notified that from the beginning of spring term, the daily food allowance would be reduced by 0.3 p to reflect the use of vegetable protein in lieu of 10% of the butcher's meat items on the standard "shopping list." Subsequently, fortnightly costings continue to reflect the inclusion of vegetable protein in the standard shopping list and the reduction in quantity of the butcher's meat items.

"Customer" Reaction

Vegetable protein has now been in use in 1,070 schools of ILEA since January 1977. The reaction to its introduction has been *NIL*.