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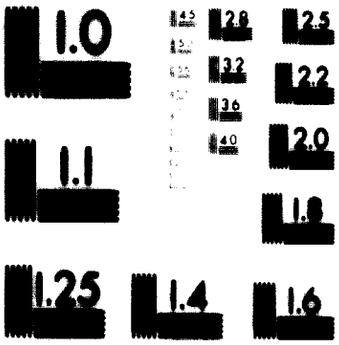

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2nd (Final) Report

To

THE GOVERNMENT OF SINGAPORE

By

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FOOD PROCESSING EXPERT
UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANISATION

DECEMBER 1970/JANUARY 1971

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This report has not been cleared with the Technical Cooperation Division of UNIDO which does not, therefore, necessarily share the views expressed.

C O N T E N T S

1 INTRODUCTION

1.1 Previous report and programme

The first report and proposed programme of work are dated October 1970.

1.2 Duration

This assignment has now been extended for a period of two months and the writer will now leave Singapore on or about the 7th of February, 1971.

1.3 Scope

This has not changed since the previous report.

1.4 Acknowledgement

The continued interest and cooperation of the Chairman, Director and staff of the Food Section, Light Industries Services is cordially acknowledged.

2 [illegible] OF NOTE

2.1 Since the previous report was compiled several events worthy of note have taken place. These are recorded below chronologically.

2.2 Gim Choong & Co. vs. Central Oil Refinery

Light Industries Services were consulted by counsel for Gim Choong on technical aspects of their action against Central Oil Refinery regarding non-delivery of a vegetable oil refinery ordered by Gim Choong from Central Oil Refinery in 1962. As adviser to Light Industries Services the writer participated in this consultancy work and was subpoenaed to appear in the High Court as expert witness on Monday 2nd November 1970. On the clear understanding that this appearance was to be in a purely personal professional capacity and not involve the United Nations in any way, UNIDO Vienna gave their assent and temporarily waived such diplomatic immunity as attached to the writer's status.

In the event, the case was settled out of court within minutes of the opening of the hearing and the writer was not called upon to give evidence. It was nevertheless agreed that the general effect was beneficial to the interests of Light Industries Services.

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2.3 Visit of Professor John Hawthorne 15.11.70 - 4.12.70

At the invitation of Singapore University, Dr. J[illegible] Hawthorne Professor of Food Science, University of Strathclyde, Scotland spent three weeks in Singapore to advise on possible courses in food science and technology at the University. The writer participated in several discussions and the likely outcome is that provision will be made for final year options in those subjects to be taken by pharmacy and applied chemistry students.

It would be natural for these developments to be associated with future developments in food processing research under joint UNIDO/ Government sponsorship.

2.4 Lecture to Food Industry Representatives

2.4.1 On 27th November 1970 the writer gave a lecture to technical and general management representatives from the food industry and other invitees from the Press and from academic and government departments, entitled "What Have We To Do With Food?" A copy of the transcript is appended to this report (Appendix I).

The lecture was widely reported in the press and resulted in television and radio interviews. It created valuable publicity for the work of UNIDO and future developments in this field in Singapore. One regrettable misrepresentation by a leading newspaper created some consternation in food manufacturing circles but all the indignation was directed at the publication, with adequate acknowledgement of the writer's freedom from blame or criticism. Press cuttings and copies of some correspondence on this subject are appended (Appendix II).

On the whole, the ultimate effect of this publicity was beneficial, even that of the uncalled-for incident of the misreported headline.

2.4.2 Subsequent meetings arising from the lecture

Subsequent to the lecture a number of invitations were received to meet for further discussion of points of interests. In all cases the writer was accompanied by a Light Industries Services counterpart.

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2.4.2.1 Dr. Tan Eng Liang (Chief Chemist of Sullig Ltd. animal food manufacturers, Jurong) Chairman of Group A (Food Manufacture), Singapore Manufacturers' Association. 9.12.70

The prime purpose of this meeting was to discuss the possibility of forming a Cooperative Food Technology and Export Committee (see final paragraph, pg. 10 of Appendix I). Dr. Tan was definitely in favour but felt that certain obstacles to its formation existed such as the air of secrecy maintained around individual manufacturers affairs, the fact that cooperation in this way is not a common feature of Singapore business; the problem of finding sufficiently important topics of common interest to a substantial number of food manufacturers; the fact that many food manufacturers felt that the Government should do more to help the industry rather than the industry itself; the fact that large firms were reluctant to cooperate with other large firms because they represent the greatest threat and were also reluctant to cooperate with much smaller firms for this would be giving away the advantages the larger firms had over the smaller firms; and the ignorance of many of the smaller firms of even the existence of the problem, let alone having a concern for cooperative means for providing solutions!

Dr. Tan acknowledged the value of a small, pro-rata financial contribution from food manufacturers but was of the opinion that Government, and possibly UNIDO, initiative and financing would be necessary initially. It should be possible in due course to persuade food manufacturers to make use of the services for a fee, which would lead to an acceptance by the food manufacturers of the value of regular contributions towards such a venture. He summarised his feelings by saying that he was enthusiastically in support of the proposals but not very optimistic regarding the outcome.

2.4.2.2 Singapore Manufacturers' Association Group A Committee, 18.1.71

This meeting was an outcome of the one referred to above and was chaired by Dr. Tan. At this meeting,

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the two separate proposals, viz: the Cooperative Food Technology and Export Committee and a possible Food Development Centre were both discussed. Although some doubts were raised and problems anticipated, some of these were agreed to be soluble and the general response was one of support pending more concrete proposals, which the committee felt should be initiated by the Government and/or UNIDO. On the subject of participation by the food industry in the government and guidance of a Food Development Centre, there was agreement in principle, again, subject to further clarification and detailed proposals. The committee agreed that it would be useful if they could suggest a few topics to be pursued by the Food Development Centre which would be of wide interest within the food industry. Some members of the committee felt that the existing Singapore Institute of Standards and Industrial Research food laboratory facilities and organisation could be made more use of by the industry and should be able to contribute some of the functions envisaged for the Food Development Centre.

Varying degrees of regret were expressed by certain members that they did not seem to be adequately informed of what was happening in various spheres such as SISIR in general, the food laboratory in particular, the writer's present assignment in Singapore, coupled with the regret that the writer's assignment was nearing completion without their having been able to make better use of the opportunities it provided (this despite general invitations made earlier to the industry to participate in discussions on various topics of importance).

2.4.8.3 A. Wander & Sons (S) Pte Ltd. Mr. Patridge(General Manager). 52 International Rd. S'pore 22. 9.12.70

Mr. Patridge suggested this visit particularly because of the current publicity regarding food hygiene and because his factory for the production of 'Ovaltine' was of international standard of hygiene. The visit confirmed this claim and established useful contacts for the Food Laboratory.

2.4.2.4 Mr. Pok Chong Chuan, Tai Hua Manufacturing Co. (Pte) Ltd., 133 Jalan Toh Guan, Singapore 5. 11.12.70

Mr. Pok is an exceptionally shrewd and enterprising 'small' food manufacturer who has invested considerably in a new, well-planned soya sauce factory. He had many interesting observations to make regarding the potential and probable future development of the food industry and was anxious to voice them to representatives of the Government and UNIDO. After a long and useful discussion he summarised by saying that in his view, proper development of the food industry would likely be hindered by :-

(1) Shortage of skilled labour (especially at the higher levels)
(2) The availability of capital for development and
(3) Inadequate facilities for, and appreciation of, marketing in various aspects.

2.4.2.5 Mr. Wong Shin Hua, Shin Hua Noodle Factory, 130, Dakota Crescent, Singapore 14

Mr. Wong, another enterprising small manufacturer, was pre-occupied by fears of the effects of an anticipated enforced move from his present premises in a residential area to a relatively distant industrial estate where his rent would be increased severalfold and where he would be unable to obtain the necessary cheap unskilled labour.

2.5 Visits to Food Research Establishments in Thailand and Malaysia

After detailed arrangements had been made and shortly before the start of the trip, agreement to the visit to the Food Technology Research and Development Centre and the Malaysian Agricultural & Development Institute, Kuala Lumpur was withdrawn. The visit to Thailand was made as planned and is reported on separately (Appendix III). Short notice arrangements were made through personal contacts to visit certain Malaysian food interests in Penang and Wellesley Province on the way back to Singapore. These contacts were useful but not as extensively valuable as the cancelled visits would have been.

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2.6 Organisational Changes

As from 1st January 1971 the Food Laboratory was transferred administratively from Light Industries Services to Singapore Institute of Standards and Industrial Research, the Acting Director of LIS Mr. Tan Hui Boon becoming Assistant Director, SISIR i/c the Food Laboratory.

3 STANDARD SPECIFICATIONS

The writer has been consulted frequently in connection with the drafting of Singapore Standard Specifications for food materials and as a result prepared a memorandum on the subject a copy of which is appended (Appendix IV).

4 PIONEER PRODUCTS TESTING

Some difficulties arose concerning the procedure for testing and certification of Pioneer food products and a copy of the writer's suggestions is appended (Appendix V).

5 TRAINING

A series of 1½ hour seminars on successive Saturday mornings was held for the professional staff of the Food Laboratory. The original intention was to deal with technical subjects within the general field of food processing. However, by mutual agreement the topics were of a more general nature and included : food standards; professional consultancy - responsibilities, liabilities, ethics and procedures; communication and report-writing - some occidental/oriental aspects; the professional and the law; the lawyer and technology; testing of foodstuffs - compositional, nutritional and other claims in advertising and labelling.

6 CONSULTANCY

Participation in the Food Laboratory's consultancy service to food manufacturers continued and a number of visits and meetings took place in conjunction with the staff of the Food Laboratory.

7 FUTURE DEVELOPMENTS IN THE FOOD INDUSTRY

Further meetings with large and small food manufacturers on possible trends in food manufacture in Singapore took place. The general impression obtained was that few manufacturers had given much thought to the long-term

future of their own businesses, much less of their sector of the food industry or food processing in general. Many were preoccupied by their immediate commercial and economic problems of : labour availability; premises; financial and other forms of government assistance; and problems of raw materials and market fluctuations in terms of price and shortage/surplus. One of the tasks foreseen for the proposed Food Development Centre is the pursuit of a clearer picture of future trends and developments (see Proposals for a Food Development Centre, Appendix VI). An attempt was made to deduce from available food industry statistical data some information on present and future trends but the consistency of statistical bases and year to year alterations in form made this impracticable.

8 FOOD DEVELOPMENT CENTRE

Detailed proposals for a Food Development Centre to be sponsored jointly by the Singapore Government and UNIDO and with Singapore Food Industry participation have been prepared (Appendix VI). It is strongly recommended that :

(a) the present Food Laboratory interests of SISIR be the sole Government involvement in Food Product and Process Research and Development through its incorporation in the proposed Food Development Centre, and

(b) the maximum practicable involvement by representative food industry participation in the Centre be encouraged in order to ensure maximum value in terms of practical end-results of the work of the Centre.

9 CONTINUING ASSOCIATION

The desirability of some form of continuing association between the writer and the SISIR food laboratory under UNIDO auspices has been further discussed. It has been agreed that in addition to periodic visits under standard UNIDO arrangements, some provision is desirable whereby the writer's services may be retained for ad hoc consultation in the U.K. It was hoped that given the desire of both parties for such an arrangement, means would be possible for this to be under the aegis of UNIDO thereby securing the advantages of a tripartite association. Such an association could continue to advantage after the establishment of the proposed Food Development Centre if mutually agreeable but would be especially useful during the period before the initiation of such a project.

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10 GENERAL CONCLUSIONS

The initial impressions recorded in the first report (October 1970) have been generally confirmed by subsequent events but possible answers to basic questions have at least begun to emerge. A closer look at Singapore's achievements, shortcomings and potential, both per se and also within the regional context, indicates that it could, with encouragement and unifying leadership from appropriate quarters, develop an important role in food process and product development. In the area of food conversion this development need only be incremental growth and improvement of the conversion operations already established in Singapore. In the case of food preservation the need is more for innovation and development of export specialties.

A Food Development Centre as proposed should aim to serve the industry from the outset in order to secure the support and respect of food manufacturers, but its major contribution would be to the future of an expanded, modernised and efficient food industry serving a wider area than Singapore itself and enjoying a growing international reputation for its particular range of products.

The two essential ingredients for a successful Food Development Centre are; firstly, the wholehearted support of both Government and Industry and, secondly, the employment (and effective deployment) of well-motivated, competent staff at appropriate levels. Size - certainly initially - is relatively unimportant and is always secondary to excellence. Singapore has the potential to acquire an international position in this field. It will the more likely attain it if key staff can be recruited at the international level even if, later, Singaporeans themselves graduate to all those key positions by virtue of their own eminence - and international outlook.

Perhaps this is a <u>third</u> requirement for a successful Centre in Singapore's special position - an international attitude, since source materials must be imported and apart from exports such a centre is hardly justified.

(Ronald Lowitt)
United Nations Food Processing Expert

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ANNEX I

A Lecture Entitled
WHAT HAVE WE TO DO WITH FOOD?

By : Mr. Ronald Jowitt
UNIDO Food Processing Expert

Mr. Chairman, Ladies & Gentlemen, I regard it as a privilege as well as a pleasure to be assigned to a great place like Singapore to help with its food processing plans and developments.

There was one requirement in the assignment specification which I felt at least I could satisfy. It said :

"Language : English "

That was until I arrived here. I found that there was Malay, there was Hokkien, Cantonese, Hakka, Teochew, Shanghainese, Hainanese, Foochow, Hockcha, Mandarin, Hindi, Punjabi , Tamil, Sinhalese, Bengali, and English. Fortunately, everyone seemed to speak English to each other and everyone seemed to understand each other - except me! I couldn't understand them and they couldn't understand me but we both were speaking English! So I hope that in the weeks I have been here I have improved my English sufficiently for you to understand me today. If not, feel free to signal accordingly to the Chairman.

What have we to do with food? The Chinese are traditionally believed to like puzzles and so I have chosen a slightly enigmatic title for my talk. Like the proverbial Chinese puzzle it contains more than one meaning. The first is "What have WE to do with food?" or, "What's it got to do with us ?" Why are we involved in it?

First of all, what have I to do with food? Mr. Tan has already told you I am an engineer and a chemical engineer at that - so what business have I with food? Well, Chemical Engineering is concerned with industrial operations in which materials are processed in order to change their composition or form or properties - examples are dyestuffs, pharmaceuticals, water, sewage, paints, plastics, acids, alkalis, gases, cement, sugar, petroleum, coal products, paper and pulp, ores, minerals - even artificial kidneys, hearts and lungs - and also FOOD! You might well ask what all these different industries have in common that they should all be regarded as the proper subject of one profession - chemical engineering. The answer is, common operations and common processes.

The origins of chemical engineering are in what were called "unit operations". All processes may be divided into a series of steps or operations and when this is done, certain unit operations in,

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say, dyestuffs manufacture are seen to be very much like certain operations which are involved in the manufacture of petroleum, or plastics, cement, paper, leather - and even food. Examples of unit operations are size grading, crushing, pelletting, drying, freezing, distilling, concentrating, mixing, filtering, and so on. For instance, dyestuffs have to be dried after manufacture, paper also ; coal is dried, sewage sludge is dried, minerals and ores and clay for bricks are dried, textiles are dried, and so are biscuits and mushrooms and sharks fin and beehoon and meehoon and fruits, vegetables, tea, herbs, spices, beef, pork, mutton, chicken and many other foods. So a knowledge of the PRINCIPLES of drying is equally applicable to all these process industries, and the same with other unit operations.

So the answer to the question 'What have I to do with food?' is 'I am a chemical engineer'. I have a great deal to do with food processing and one of chemical engineering's great contributions to the business of food processing is its ability to cross boundaries between different industries and apply solutions and techniques and advances from one process industry in another. One of the first rules of science, technology or engineering is "Before trying to solve a problem first try to find out if someone has already solved it before you". Nine out of ten problems which occur have their counterparts in other industries and the most successful technologist is the one who knows how to find out where the nine solutions may be found. After all, even if he can't solve the remainder by his own efforts, we're all allowed a 10% failure rate, aren't we ??

Seriously, it is his knowledge of principles applicable to all industries which enables the competent chemical engineer to recognise the similarity between apparently unrelated situations and to use the one to help the other. Perhaps, this is the real secret of success - being able to know which are the right questions to ask!

Now, "What have we to do with food?" - "We" being the National College of Food Technology of Weybridge, England, from where I am at present on leave for this assignment.

Time does not allow me to tell you all I would like to about our work at the College but I can provide more information to anyone who cares to let me know later.

Two weeks ago, the NCFT celebrated the tenth anniversary of the opening of its present premises by His Royal Highness, The Duke of Edinburgh but it was actually set up some years earlier, after the war, before there was a recognised profession of food

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technology in Europe. Its purpose was to train professional people for senior technical, production and general management posts in the British food industry.

For all practical purposes, all the food technologists trained as such in Britain to University degree standard have been trained at Weybridge, and an increasing number from many overseas countries, including Singapore, are also being trained there.

By virtue of its association with the University of Reading, it awards an honours B.Sc. in Food Technology and M.Sc., M.Phil. and PhD. degrees in this general field.

The B.Sc. course is what is, aptly in this case, called a 'sandwich' course which means that out of the total of four years, undergraduates spend eighteen months in four periods of varying length in industrial training. This is organised jointly with a large number of large, medium and small companies in the food industry in Britain, and, now, abroad also. (Students have been to Sweden, Yugoslavia, Germany, Belgium, Holland, Canada and even Africa for spells of industrial training during their course.)

Although the training is an integral part of the University degree course the students undertake increasingly responsible duties and receive an agreed wage from the firm.

We find that this sandwich or 'integrated' form of training has much to commend it for training professional people to go into industry and the food manufacturers are so pleased with the "product" from the course that they pay a higher starting salary than to graduates from full-time courses. There are many aspects which might commend themselves to Singapore if a University degree course in food technology should in due course be introduced at the University.

When we first started the course we used to wonder if we would manage to find enough places for the annually increasing number of students at the College, but the handful of 'founder-firms' gradually expanded and every year we found we had more training places available than we could fill. I would like to pay tribute to the 'enlightened self interest' of British Food Manufacturers in cooperating in this important work.

At first they were, as you might be, suspicious, full of the potential problems, reluctant, but after the first sweet smell of success more and more firms joined in and now we receive unsolicited requests from new firms to join the list of firms to take students.

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May I suggest that next time any of you visit Britain, you try to visit some of these U. K. firms and find out about their experiences, with a view to your participating in a similar scheme here one day. I would be glad to help arrange it.

(Some slides of the College and Industrial Training)

As you will gather from these slides the College has one of the finest food processing and engineering pilot plant facilities in the world and is pre-eminent in the food engineering aspects of the profession. In recent years the postgraduate school has expanded considerably and some quite novel projects have been initiated.

For example, one of my research students was recently awarded Britain's first PhD. in food engineering for a feasibility design study of the heat-processing of canned foods in heated beds of fluidised solids. This process is being patented and jointly exploited by the National Research Development Corporation and the inventors. A pilot plant may be built at the British Food Manufacturing Industries Research Association. Some of this work was also carried out in industry in conjunction with food manufacturing firms. That student has now been awarded a fellowship at the University of Cambridge.

(2 Slides)

Another important project on which several workers are engaged is the Centre for Data on Physical Properties of Foodstuffs. Another active team is working on the texture of foods. My personal experience of foods in Singapore is that texture is an extremely important attribute of Chinese food and our scientific work could benefit from cooperation with Singapore in the general field of food texture.

(1 Slide)

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But enough of Weybridge! "What have WE to do with food?" - that is, UNIDO. I speak today in a purely personal capacity but you will wish to know what the broad purpose of my being here in Singapore is.

UNIDO is a relatively young branch of the United Nations and its purpose is to promote and accelerate the industrialisation of the

developing countries of the world with particular emphasis on the manufacturing sector. I am here to help that purpose in respect of the food manufacturing industry.

My mission is threefold ; firstly to help train the personnel engaged in food technology work in Singapore ; secondly to advise and participate in the work of the Food Advisory Service of Light Industries Services, and through them the Singapore Food Industry ; thirdly, to help to find out in what direction the Food Industry of Singapore might or should develop and at what pace, so that appropriate programmes for assistance from the United Nations Technical Assistance, Special Fund or other schemes might be formulated. In all these aspects, but especially the last, I urgently need the help and cooperation of all of you.

I have had discussions already with quite a number but will look forward to individual meetings with as many others as can be arranged during my stay so that we can benefit from all your opinions.

I believe that whilst the benefits of modern technology, science and engineering should be brought to bear on Singapore's food manufacturing future, in this respect my earlier comment about finding out whether someone else has solved the problem already offers false security, because Singapore's problems, now and in the future can only be solved in the setting of Singapore's own strengths and needs. I have seen enough already to believe that Singapore could outstrip many of the already-developed countries in certain fields but it will not do so by the crude, ill-considered copying of other peoples' solutions to <u>their</u> problems. In the first place the solutions might not be the best ones for <u>their</u> problems !, in the second place <u>their</u> problems are almost certainly not identical to <u>yours</u> even though they might superficially appear to be.

So, people like me, here for a limited period, can do so little. Without your unstinted participation and active cooperation nothing will be achieved. With it there is no limit to what might be possible.

The 17th century English Poet John Donne wrote, long before there was a Singapore community, 'No man is an island intire unto himself, for each is a part of the continent, each man's death diminishes me, for I am a part of mankind. Send not then to ask for whom the Bell tolls' (the funeral bell) ;' it tolls for thee'. At no time in man's history has the need for cooperative existence been more important. Each is now a part not just of 'the continent' but of the shrinking world. I invite your cooperation in this important work , with me, but far more importantly, with each other.

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"What have WE to do with Food?" - What have LIS to do with food? Your Chairman is the one who should answer that question, not I, but we all know that the Food Advisory Section of LIS exists for the sole purpose of helping Singapore Food Manufacturers in product development, problem-solving and consultancy generally.

None of us in LIS, I believe it is true to say, is satisfied with the service we are able to provide. To be so would be complacent. But we have had our successes and our failures and we are appreciative of those firms who have sought our help, have made possible our successes and have borne understandingly with our failures.

We need more experience, more competent professional staff to strengthen the existing team, and most of all we need the support and understanding of you in industry if we are to give you our best.

"But", you might think, "shouldn't it be the other way round? Aren't you there to support us? "True, but we can achieve nothing without a proper understanding with you.

The introduction of wheelbarrows in one town in Africa was a failure. Months after they had been delivered the importer visited the town to find them all in use, but being carried around on peoples' heads!

There was nothing wrong with the wheelbarrows. It was just that the people didn't know how to use them!

I mentioned earlier the importance of knowing the right questions to ask. This is true here too.

There is an old English popular song which goes "If you want to know the time ask a policeman!" Many visitors to London say "We think your policemen are wonderful!" But I should hate to think that this is only because they always know what time it is! In order to get the best out of a service you have to know what sort of questions to ask it. The lads in LIS are game to tackle any request, I know, but with the best will in the world, they can't be expected to know all the idiosyncrasies of all your individual processes.

Don't expect them to possess some mystic ability, to know instinctively the exact answer to why a batch of your product had a particular off-flavour or how to formulate in advance an exactly correct specification with respect to taste or smell or texture or colour. All that you can reasonably expect them to have are trained minds and professional abilities as scientists or technologists and to be able to help you to ask the right questions of the situation.

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As an American colleague puts it "These fellows pull their pants on a leg a time like the rest of us!"

So please try to get to know what questions to put to LS in order to get the best out of them, and please give them a fair chance by providing them with all the relevant facts.

Don't be like the Irish Stonemason who told his workman to carve a headstone and then changed his mind halfway through the epitaph which then ran :

"Here lies the body of Edward Burke,
A noble man entirely,
He died at last aged 86,
And the name's not Burke - its Reilly!"

-All the facts , please - at the beginning !

Finally, please be assured of the confidentiality of your relationship with LS. The Food Advisory Consultancy is a professional service provided in a truly professional manner. If you require the utmost secrecy it will be ensured. If you do not mind others knowing you have consulted LS, or the general nature of your enquiry, we should welcome the opportunity to mention it to other firms who might be encouraged to use LS also. We shall respect your wishes and act accordingly.

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"What have WE to do with food?" - What have you to do with food? Let's be quite honest about it. You are in the food processing business to make money. Singapore's economy is one of free enterprise and that means healthy competition, survival by profitability. There is nothing wrong in this. People have to eat, someone has to supply the food and that someone has to be adequately rewarded for doing so - even if only to make sure he stays in business to continue supplying the food !

The laws of survival in private enterprise are the same all over the world, developed and developing countries alike - the short term or long term minimising of costs and maximising of profits. In strict business terms all that the enterprise has to do besides that is (a) keep within the law and (b) keep its "image" good so as to minimise the likelihood of new laws being introduced which would further limit its freedom of action. These last two require-

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ments in the case of food processing together mean that the product has to be of a minimum standard of quality and should avoid creating situations which could show it up publicly in an unfavourable light.

Looked at from one angle, you have to do with food in two different areas : domestic consumption and export. From yet another angle you are either preservers of food - canning, freezing, drying - or converters of food - vegetable oil extraction and refining, sugar refining, fermented sauce production, baking, chocolate and sugar confectionery manufacture.

It seems to me that these are important differences in relation to future developments.

Which brings me to the other meaning of the title question: "What have we to DO with food?" What is to be done with food, what are the future opportunities and problems of the food industry both generally and particularly in Singapore?

One thing which I hope you will do with food in Singapore more than anything else is keep the superb abundance, variety, quality, subtlety, and hopefully, the cheapness which is found here in such measure.

How significant it is that the English who are so concerned with the weather greet each other with "Good Morning" "Nice day", that people in troubled areas greet with "Shalom" ("Peace")or"Apa Khabar" ("What's the news"), that travellers in Africa part with "God go with you", answered by "God stay with you" - and that the colloquial greeting in Singapore is "Shih pao ma?" "Have you eaten yet?" - This appears to be a measure of the extent of Singaporeans' interest in food. So how is the pattern of expenditure on food likely to develop in Singapore in the next decade or two ; what do we have to do with food in this period. And what has to be done by, and for, those who 'have to do with food' - producers, manufacturers, distributors and suppliers of foods, especially in Singapore?

I hope you will help me answer these questions in the coming weeks, but today I would like to throw out a few - possibly contentious - ideas, purely from my own personal point of view, not the UN's, not the Government's - just my own.

First of all, we have to make certain assumptions about Singapore's - and the world's - future in general. Let us assume that what we all hope for will be so and that the world, and this region especially, will have found the means of living really at peace with each other. Let us also assume that the pace of industrialisation,

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whereby the fruits of modern technology can be enjoyed by everyone everywhere, will continue and that Singapore will remain in the forefront of achievement in the region.

Next we have to ask ourselves whether the consequences of urbanisation and industrialisation will be similar in Singapore to those in other industrialised countries.

Will cheap labour disappear? Will the spread of incomes and standards of living diminish so that the rich get poorer and the poor get richer, relatively speaking? Shall we see the disappearance of household servants and their replacement by dishwashers and washing machines and rotary ironers ?

We are told that one consequence of industrial automation will be a vast increase in leisure time for people. How will the people of Singapore spend theirs ? Will there be an inevitable fall in the standards of service and certain kinds of quality of workmanship as in many other countries ? At present most Singaporeans use the services of the various specialised trades. But will a fall in quality of service and the availability of more leisure lead to a "Do-it-yourself" boom as in the West?

And where, how, when and what will people eat? It is easy to assume that what has happened in Britain and America will also happen here , with canned, frozen, dehydrated and even irradiated food being consumed on an ever increasing scale. Instant breakfasts, precooked porridge, coffee powder, TV dinners and a whole range of other convenience foods. Personally, I don't think that assumption is necessarily correct. What is more, I believe that you, the people of Singapore can choose what your food will be like in the years ahead. It all depends on the consumers' relative priorities.

The examples of Britain, Germany, America are often quoted as the likely - sometimes as the inevitable - pattern for the future food of developing countries, but Singapore is too much like France, gastronomically speaking, for her necessarily to follow the Anglo-Saxon path to processed food diets. It is obviously much easier for processed or convenience foods to displace fresh equivalents in a community which eats to live than in one which lives to eat. And when the standard and refinement of food is as advanced as it is in Singapore, processed food will have a very difficult job to replace it.

And why should it, why should it? France remains a country where culinary art has not capitulated to convenience foods : Singapore could follow suit. The French have to pay dearly for their pleasures, of course, and as they, like other European countries,

/10. . .

no longer have servants to cook elaborate or exact dishes they accept that they must spend a relatively large proportion of their incomes on eating well in Restaurants where excellence of cuisine is a matter of honour and the bill of lesser consequence.

So what have we to do with food - in the future ? So far as the domestic market is concerned there must be few food technologists who would dare to challenge the present fresh food market with processed or preserved alternatives.

But equally, no food technologist could fail to respond to the challenge to preserve some of the many Singaporean dishes for wider enjoyment in export markets. Food exports are not a significant proportion of either the export or the food scene in Singapore. For them to become so, the level of technology will surely have to match the organoleptic level of the local dishes. Perhaps this price is too high to pay for the returns from export of food, but it would bear less heavily on individual firms if it were the subject of cooperative research, development and promotion within Singapore.

It is always unreasonable in a free enterprise economy to expect unlimited cooperation between competing firms and the greater the predominance of domestic sales, the greater the disincentive to cooperate. However, there are areas where cooperation need not weaken one's competitive position - or even more important - one's profitability, and cooperation in developing export-orientated products is perhaps one such area.

Another area is that of industrial training of professional food technologists mentioned earlier.

Another is research and development into problems common to all member firms such as effluent disposal and water economy, foreign body detection, packaging problems, additives, preservatives, and colouring matters, Standards, legislation; hygiene in design and in operation.

But such cooperation needs to be planned and organised. May I suggest the setting up of a Cooperative Food Technology and Export Committee sponsored by, say, Branch A of the Singapore Manufacturers' Association, The Food Manufacturers Association, and the appropriate Singapore Government Departments. The object of such a group would be to study at the necessary technical and commercial level such common areas of interest and to sponsor actual work in the research and development of products and solutions to problems. It might even in due course establish a permanent nucleus of commercial and technical specialists with facilities for such work and possibly,

/11...

qualify for support from national and international funds.

The British brewing industry contributes a penny for every barrel of beer produced to a central fund, which is then centrally administered in order to help pay for a similar brewing foundation programme relevant to the industry as a whole.

This sort of thing is, in a sense, optional to food manufacturers. What is not optional is the need to adapt to changing economic, commercial and technological conditions.

Running a business in the modern world is rather like going up the "Down" escalator! You have to walk pretty briskly to stay in the same place and if you relax you immediately start losing ground. You have to exert yourself quite considerably to improve your position in relation to your surroundings !

Modern technological innovation demands investment in more complicated and expensive equipment. This in turn displaces unskilled labour but necessitates more skilled operatives and managers.

The effect of this is to change the business from a labour-intensive to a capital-intensive one with associated far-reaching changes in both production and costing methods. Then the emphasis will be on maximising the operating time of the plant so that the substantial fixed charges are spread over the largest volume of product. A capital-intensive plant operating at high load-factor will always tend to produce cheaper goods than a similar labour-intensive operation but it must be run efficiently and competently at high outputs. Thereafter, each unit of product produced beyond the normal output costs very much less and can be used in a variety of ways to extend one's business both domestically and overseas.

The economy of scale of production is another strong factor in modern manufacturing industry.

An approximate idea of the savings in <u>plant</u> costs is given by the 'sixth-tenths' rule. It has been found that for a large number of different types of manufacturing plant, especially process plant, ranging in relative size over several orders of magnitude, the ratio of the costs of two different size plants is equal to the ratio of their outputs (or capacities) to the 0.6 power or

$$\frac{C_1}{C_2} = \frac{\text{output}_1}{\text{output}_2}\left(\frac{6}{10}\right)$$

/12...

The following diagrams show this for different kinds of plant.

(One Slide)

The rule is sometimes quoted as the two-thirds power rule - it is then easier to work out on some slide rules.

For example, if plant B has an output of 3 times that of plant A, and the cost of plant A was $100,000, then the probable, approximate cost of plant B will be

$$100,000 \times \left(\frac{3}{1}\right)^{0.6} \quad \text{or} \quad \left(\frac{3}{1}\right)^{\frac{2}{3}} \ (= 0.67)$$

$$= 100,000 \times 2.08 = \underline{\$208,000} \ (\text{not } \$300,000)$$

This inherent competitiveness of the larger plant is leading in other countries to the merging of companies, to the building of bigger and bigger installations and to the expansion of markets for the sale of the increased volume of production.

How will these pressures affect Singapore's food manufacture? What have they to do with food?

That, as they say, is 'your problem'!

But not only yours. It is also the problem of the Government and of UNIDO. We don't know the answers, of course, no one does, but if together we can be more sure of asking the right questions then surely the right answers are more likely to emerge in due time.

RJ/ec
25 November, 1970.

Appendix II

Press Cuttings and Comment

Singapore Herald

25th Nov., 1970.

GOVT GETS ADVICE FROM BRITISH FOOD EXPERT

A BRITISH food technologist is here for a short assignment to advise the Government on food processing — with a grant from the United Nations [illegible]

Mr Ronald Jowitt, of the National College of Food Technology at Weybridge, Surrey is with the Light Industries Services of the Economic Development Board.

Lecture on food

He will lecture on food industry developments to a group of representatives from the local food industry on Wednesday at the A A Theatrette from 5 p.m. to 6 p.m.

Mr Jowitt is a Member of Council of the Institution of Chemical Engineers of London and has been advising local technologists who want corporate membership of the institution.

He helped design a new process for sterilising canned food in hot, liquid baths, which is now being developed by the National Research Development Corporation of Britain.

Mr Jowitt has also held senior positions in the chemical engineering, process contracting and nuclear industries and for a time was general manager of a consortium of several leading British firms designing and building nuclear chemical engineering installations.

SINGAPORE FOOD NOT HYGIENIC ENOUGH SAYS EXPERT

...[illegible] manufacturers

Straits Times

26th November '70

SINGAPORE, Wed. — Singapore's food production is not up to the standard of hygiene demanded internationally, British food technologist Mr. Ronald Jowitt said today.

"It is encouraging to see hair-covering by workers in some factories. But even then the way they are put on seems to be serving a decorative purpose rather than preventive of food contamination," he said.

Mr. Jowitt, 46, who is here on behalf of the United Nations Industrial Development Organisation to help the Government on food processing, was giving a talk on "What have we to do with food?" to technical and general management representatives from the Singapore food industry at the Automobile Association Theatrette.

Research

He is also here "to help find out what direction the food industry of Singapore might or should develop and at what pace, so that appropriate programmes for assistance from the UN technical assistance special fund or other scheme might be formulated."

He said that the potential contamination of female head-hair was "by three greater than that of the

Mr Jowitt called on food manufacturers to co-operate among themselves for research into common problems, the setting of standards, legislation and hygiene.

He suggested the setting up of a "Co-operative Food Technology and Export Committee" to be sponsored by the Singapore Manufacturers' Association, the Food Manufacturers' Association and the appropriate Singapore Government departments.

Solutions

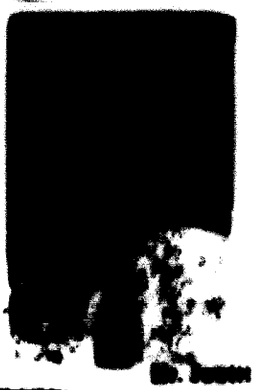
"The object of such a group would be to study at the necessary technical and commercial level such common areas of interest and to sponsor actual work in the research and development of products and solutions to problems.

"It might even in due course establish a permanent nucleus of commercial and technical specialists with facilities for such work and possibly quality for support from national and international funds."

He also suggested the possibility of imposing a levy on food manufacturers. The funds accrued would then be used to finance research on the production of the participating firms. [illegible] the levy was imposed. He cited the levy on British brewery a[illegible]

SINGAPORE HERALD 26.11.70

'We don't eat just any food'



Singapore Herald
26th November '70

一九七〇年十一月廿六日

聯合國食品加工業專家主張

設立機構研究 改進食品工業

在某些方面新加坡還[illegible]國家

（新加坡廿五日訊）聯合國工业發展机構食品加工业专家罗納爾域，今日应轻工业服务所之邀，在新加坡汽车公会俱乐部主講有關食品加工業的工艺问题。

罗納爾域以他个人的身份，[illegible]新加坡[illegible]公会、食品[illegible]公会，以及有關政府部門，联合[illegible]食品工艺及出口[illegible]会，以[illegible]技术及商业问题，以及进行研究与产品[illegible]工作和解决问题，[illegible]可以[illegible]立商业与技术专家的永久核心，可能的[illegible]有供进行此种工作的設备，[illegible]国内与国际[illegible]的[illegible]。

較早时，罗納爾域[illegible]多[illegible]已[illegible]的国家，但他乃应联合国工业[illegible]机構之邀，协助新加坡从[illegible]食品工艺工作的人員，出任轻工[illegible]业服务所食品[illegible]会的顾问；协助[illegible]求新加坡食品业[illegible]方向与联合国技术协助，特别[illegible]其他[illegible]出。

罗納爾域[illegible]，新加坡[illegible]已[illegible]过好[illegible]，却不[illegible]其他人民对他们的问题的解决办法[illegible]，因为具体情况各自不全，何况[illegible]解决方法不[illegible]好者。

他[illegible]，轻工业服务所食品[illegible]会[illegible]新加坡食品[illegible]的产品[illegible]，解决[illegible]乃[illegible]一[illegible]，它是一个专业[illegible]机构。

[illegible]及新加坡食品工[illegible]业来的机会与[illegible]的问题，罗納爾域[illegible]加坡的食品工业应当[illegible]到保持食品多[illegible]化，品[illegible]优良，[illegible]价[illegible]的水平。

他[illegible]，当一个社会中，人民[illegible]为了生存而不[illegible]为了[illegible]的时候，[illegible]以加工[illegible]代[illegible]的食物，[illegible]。而[illegible]新加坡[illegible]水平[illegible]时，加工的食品[illegible]代新[illegible]食[illegible]十分[illegible]的。所以在将来，[illegible]以国内市场[illegible]而[illegible]，必須要有几个[illegible]於向目前新[illegible]食品市场[illegible]的食品工艺[illegible]，[illegible]加工的食品来与之[illegible]。同时也[illegible]法子使一些新加坡可口的食品供出口市场。

早些时候，罗納爾[illegible]也[illegible]到食品加工的[illegible]程序，同时[illegible]以补助说明，介[illegible]食品加工[illegible]的生产情况[illegible]时，也促[illegible]食品[illegible]加以改进，以便适应[illegible]，[illegible]工艺的情况。

[illegible]，新加坡[illegible]九六八年[illegible]食品的[illegible]。

羅納爾域氏

Nanyang Siang Pau
26th November, 1970

(translation attached)

Translation from Nanyang Siang Pau
dated 26.11.70

United Nations Food Expert's suggestion :-

"To establish a Co-operative Food Technology and Export Committee.

To improve food processing techniques in Singapore"

Mr. Ronald Jowitt, Food expert of United Nations Industrial Development Organisation, was invited by Light Industries Services to give a lecture on food processing techniques at the Automobile Association.

Mr. Jowitt open his speech by saying that the Singapore Manufacturers Association, Food Association and related Government bodies should set up a Co-operative Food Technology and Export Committee, to carry out research on processing techniques. The Committee should also establish a permanent centre for commercial and technical specialists. Furthermore if assistance is available from local and international bodies, the committee can also set up related facilities for carrying out further research along similiar lines.

At present, Mr. Jowitt is here on a United Nations Industrial Development Organisation scheme to help to train local food technologists, and to act as Consultant of Food Advisory Service of the Light Industries Services. In this direction, he has taken steps towards developing local food industries and to provide technical assistance.

Mr. Jowitt added that food technologists here should attempt to solve local food problems in the light of local existing environmental conditions.

He also said that the F.S of the LIS is set up to assist in the product development of the Food industries in Singapore, and to provide Consultancy Services.

In view of future opportunities and problems which the food industries have to face, Mr. Jowitt stressed that local products should be of standard quality and variety.

Under present conditions, where people are inclined to take the attitude of "living to eat", it is necessary that preserved food should also be made available. It follows therefore that local food technologists should introduce more preserved food into the local market and also to recommend them for export.

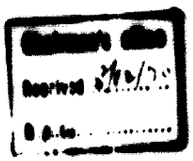
In conclusion he stressed that local food manufacturers should upgrade their performance in the light of present conditions.

For information, in 1968, Singapore spent billion dollars on food.

新加坡食品厂商联合会
SINGAPORE FOOD MANUFACTURERS' ASSOCIATION
388-B JALAN BESAR, SINGAPORE, 8. TEL: 33236

28th., November, 1970.

The Chairman,
Engineering Industries Development Agency,
(EDB Industries Services)
Economic Development Board,
170 River Valley Road,
Singapore, 6.



Dear Dr. Lee,

We thank you for your letter of the 26th instant, together with the valuable copy of the letter, which Mr. Jouitt wrote to the Editor of the Straits Times, concerning its report, on the food industry in Singapore.

We had no doubt that the original lecture made by Mr. Jouitt was grossly distorted and misconstrued, by the Straits Times reporter.

In the circumstances considered, it is only fair that the Straits Times should publish Mr. Jouitt's reaction on this distorted report, in full - to at least clarify Mr. Jouitt's original well intentioned remarks.

On our part, we have written a strong letter of protest, to the Editor of the Straits Times, a copy of which is enclosed herewith for your kind reference.

Yours sincerely,
SINGAPORE FOOD MANUFACTURERS' ASSOCIATION.

.....
Chairman - Lim Kim Poey

Encl:

Dr. Lee
Mr. Jouitt
8/12

新加坡食品廠商聯合會

SINGAPORE FOOD MANUFACTURERS' ASSOCIATION

368-B JALAN BESAR, SINGAPORE, 8. TEL: 33236

27

28th., November, 1970.

[redacted]

Dear Sir,

We are shocked and appalled to say the least of it, at the [redacted] in which you headlined a lecture given [redacted] on food technology in your issue, dated the 16th of November, 1970.

We feel sure, that at no time did Mr. R. Jowitt, say or even implied the distorted statements as printed in your [redacted] - it is obvious that the worthy gentleman, was grossly misquoted and misunderstood.

In the interests of truth and justice, the least you could do in the circumstances, is to rectify your error, by publishing an article clarifying the whole position.

Yours faithfully,
SINGAPORE FOOD MANUFACTURERS ASSOCIATION.

.....
Chairman - Lim Kim Puay

Part 1 Eastern Sun [illegible], November 27, 1970

LOCAL FOOD MANUFACTURERS DENY NEWS REPORT

ANGRY food manufacturers yesterday vehemently denied a news report that their manufacturing processes are unhygienic.

They fear that the report — allegedly distorted — would harm Singapore's food manufacturing industry.

They were commenting on a news report quoting British food technologist Ronald Jowitt as saying that Singapore's food production was not up to the standard of hygiene demanded [illegible] internationally.

Mr Jowitt, [illegible], is in Singapore on behalf of the [illegible] to help the Government on food processing.

He was reported to have [illegible]

Mr Jowitt said he had [illegible]

[illegible]

The Chairman of the Singapore Food Manufacturers' Association, Mr [illegible], said:

"I strongly believe our food production [illegible] those are up to international standards.

"Such false statements would only serve to damage our food business.

"For the [illegible] year several [illegible] in the food [illegible] line have [illegible] Singapore and they [illegible] [illegible] processing.

"As far as we are concerned, we are very hygienic in our food preparation," he said.

"Untrue"

A spokesman for Ye [illegible] also dismissed the report as untrue. [illegible] described the report as a "misconception" which might influence people into boycotting food products manufactured in Singapore.

Other food manufacturers shared similar views.

They stressed that their factories have to abide by the Food and Health Regulations imposed by the Government.

All agreed that Mr Jowitt's suggestion to set up a Co-operative Food Technology Research Committee was a good idea.

The Committee would study areas of common interest and sponsor the [illegible] work in the research and development of products and solutions to their problems.

Standard

Leading food manufacturers [illegible] [illegible] than [illegible] have how to [illegible] the local food production standard" they said.

All the manufacturers said they would prefer the Committee to be co-sponsored by the Government and the private sector.

• • •

Eastern Sun
dated 27/11/70

WEDNESDAY, Dec. 2, 1970.

Food: A top industry

SINGAPORE exports a wide range of foods —from confectionery to canned fruits, pickles and meat. Together they represent a more than [illegible] million a year industry which accounts for about one-fifth of the Republic's total industrial output. Being labour intensive it is also a good employer, providing work for about 8,000 workers or one-seventh of the total labour force in the manufacturing sector. Where a premium must be placed on high productivity the food industry seems to be doing nicely with one-seventh of the workers producing one-fifth of the total industrial output.

Singaporeans are taking increasingly to canned food, [illegible] for working wives who have only to nip into a supermarket to get what they need. Processing and packaging techniques today are such that little of the nutrition or flavour is lost.

With a growing market not only at home but also abroad it would be sad, and one might even say criminal, if opportunities are not seized. The competition is stiff but people will pay for quality. Under no circumstances must standards of hygiene be sacrificed. Singapore's standards are high but not high enough, according to a British food technologist now in the Republic to put food processing on a sounder footing.

He has observed that these white caps worn by workers in food factories appear to serve more a decorative than hygienic purpose. In many cases it is obvious that they are far too small to cover the whole head. It will take only one strand of hair to put consumers off.

Food [illegible] in Europe and the U.S. are watched over closely by their respective governments. A [illegible] analysis [illegible] taken by the [illegible] Department of Chemistry [illegible] fruit [illegible] and soft drinks. They were found to contain [illegible] amounts of preservatives. It highlights the need for vigilance on the part of the authorities. But the manufacturers themselves must realise that it is in their long term interests to keep within specified limits and see to the highest standards possible.

The suggestion that food manufacturers co-operate among themselves for research into common problems and other allied aspects should be taken seriously.

The food industry will have to look ahead if it is to get ahead. Only through research can a product be improved and for this there must be funds. Food manufacturers should not grudge a small levy imposed on them for this purpose.

Straits Times

2nd Dec. 1970

Food hygiene

I THINK your report and in particular your headline of my lecture (S.T. Nov. 30) does less than justice both to my statements and, much more importantly, to the interests of Singapore.

Let me state quite categorically that I did not at any time say that Singapore food was not hygienic enough.

In fact on the contrary I was full of praise for the standards of food in Singapore.

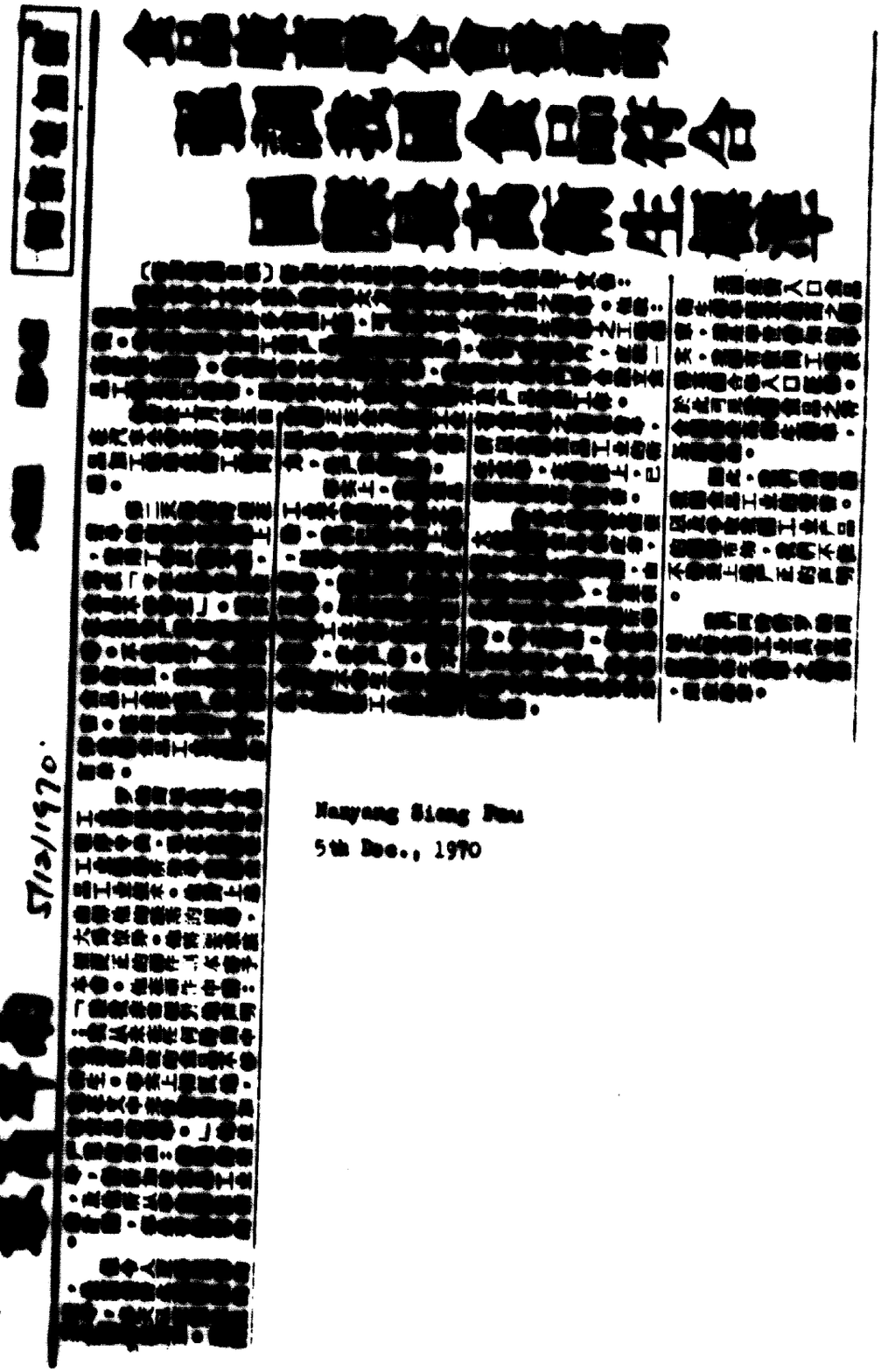
What I did say was that exports and hygiene were possible areas for co-operation between food manufacturers in Singapore and that a uniformly high standard of hygiene was important in production for the international food trade.

I said that many of the factories that I had visited were quite comparable in standard to any I had visited in the world but that some others could well look to their standards of hygiene.

RONALD HOWITT.

UNIDO Food Processing Expert.

Light Industries Services,
Singapore 5.



Nanyang Siang Pau
5th Dec., 1970

Translation From Nanyang Siang Pau
dated 5 December, 1970

"Statement by Food Manufacturers' Association stresses that Singapore foods conform to International Hygienic Standard"

The following statement was made by Singapore Food Manufacturers' Association :

The U.N. Food Processing Expert, Mr. R. Jowitt has praised the high standard of Singapore food industry. "According to his visit and observations, our food factories are comparable to other factories in the world in terms of standard of hygiene. In his view, the food industries in our Republic should, as far as possible, have a unified health standard for purpose of expanding international trade. He said that Singapore food product should have a Unified hygienic standard in order to export to international market and he suggested that Singapore Manufacturers' Association, Food Association and related Government bodies should set up a cooperative Food Technology and Export Committee to carry out research on processing technique. He said these in a speech given on 25 November, at the A.A. Theatrette. The following day, the Straits Times published his speech under the heading "Singapore Food Not Hygienic Enough," which is in contrary to what he said. The misquoting is serious. It not only distorted Mr. Jowitt's speech, but also damaged the image of Singapore Food Industries. Some of the orders from Overseas buyers could have also been dismissed by the headline.

Mr. R. Jowitt is an UNIDO Food Processing Expert who is now attached to the Light Industries Services to advise on food processing techniques. He was surprised by the above misquoting. He has forwarded us a carbon copy of his letter sent to Straits Times asking for correction. In the letter he says, "Let me state very categorically; I have not at any time said that the food produced in Singapore has not reached the adequate standard of hygiene. On the contrary, I have in my article given full praise to the standard of food produced in Singapore." He seriously pointed out that misquoting is damaging Singapore food industries and affecting its aid from the UNIDO.

It is regretted that for the past few days, the Straits Times did not amend its statement. It is ruining our country particularly when it is now under industrialisation and struggling for international markets for its products.

As a matter of fact, even before the ... expert pointed out, we have already been upgrading the hygienic standard of our food industries to the level comparable

/2...

to international standard to enable us to explore for international market. Besides, our Government also imposed a strict hygienic control upon our food industries, which ensure no inhygienic conditions to occur. And with the guidance of the Light Industries Services Food Section, the hygienic standard of our food industries has long enjoyed good reputation overseas.

Normally Overseas buyers will call for tender from several countries when they want to order large quantity of canned food. And very often, our food manufacturers managed to win the tender through the keen competitions. These buyers normally send their own experts to inspect the foods and each time they were satisfied with the hygienic standard.

We all know that U.K. is the country who imposes the most strict hygiene standard on imported foods and yet a number of our food manufacturers were able to obtain import licence from her. It is, therefore, doubtless to say that our food products have already met with the international highest hygienic standard.

In order to protect the reputation of our food industries and to seek forinternational market for our food products, we have, therefore, to make the above statement.

We are grateful to Mr. Ronald Jowitt for his praise to the high standard of hygiene of our food industries.

KWH-lah
8.12.70

Appendix XVI

Notes on a visit to food research establishments in Thailand on 21st, 22nd, and 23rd December, 1970

Introduction

These visits were arranged by Mr. Nils Ramm-Ericson in connection with the undersigned's assignment as Food Processing Adviser in Singapore with particular reference to the possibility of a food research institute being established in Singapore with UNIDO's assistance. All three food research establishments in the Bangkok area were visited in company with Mr. Tan Hui Boon, Ag. Director of Light Industries Services, Singapore. Principal objectives of the visits were : -

(a) To learn the nature, scope and activities of these research institutes.

(b) Hence to determine whether their existence would influence the nature and scope of any proposed Singapore food research organisation.

(c) To establish contacts which might subsequently be of mutual benefit.

1. Applied Scientific Research Corporation of Thailand (ASRCT) Technological Research Institute (TRI) Bangkok Visited on 21st December, 1970

Present :

Dr. Pradisth Cheosakul - Director General
Dr. Kasem Balativa - Managing Director, TRI
Prince Kokosat Svasti - Co-Managing Director
Dr. Saman Vardhanabhuti - Head of Biotechnology
Mr. Nitasni - Secretary of TRI
Dr. C. Lewis Wrenshall - Project Manager (UNIDO)

General

The UNIDO project concerned with the establishment of the TRI commenced in March 1964 and is continuing at a reduced level in order to support specific aspects of the work including certain food projects. These food projects were the main items of interest for this visit but much of the discussion was taken up by ASRCT members asking general questions about the operations of Light Industries Services in Singapore. Because of this, Dr. C. Lewis Wrenshall joined our later visit to the Preserved Food Organisation at Ban Pong to provide further opportunity

/2...

for discussion of matters relevant to the purpose of the visit.

Major Projects

(i) Non-Food

Active work is proceeding on Kenaf production and fibre utilisation, in particular the development of a paper from Kenaf fibre. The extraction and evaluation of essential oils from local species is proceeding towards development of commercially valuable products. In addition, the extraction of pharmaceutically active materials from local plants has achieved some promising results.

(ii) Food

This area is to be emphasised in the future programme of the TRI but progress has already been made in several directions. A comprehensive list of products developed, dated November 1970 is published by the TRI and need not be reproduced here.

Despite increasing evidence to the contrary elsewhere, there appears to be considerable evidence that in many parts of Thailand there is a protein deficiency although no shortage of food, particularly in the infant age group. This arises from undesirable domestic customs resulting in the weaned infant being fed a highly unbalanced, protein-deficient diet. Many of the products developed at TRI are accordingly directed at alleviating this situation by presenting products which would fit readily into the traditional domestic dietary pattern and which would remedy the deficiencies. Such products include a protein chip (16-22% protein content) resembling the traditional khaokriap; high protein (19-20%) noodles and macaroni incorporating mung bean or soy bean protein concentrates; instant versions of the foregoing; vegetable sausage; cocoa-soy milk and cocoa-soy paste (banana flavoured for spoon feeding to children ; soy milk (3% protein), evaporated soy milk (7% protein),

/3...

and soy custard (8% protein) for spoon feeding to children; snacks soups and biscuits based on mung bean, rice, peanuts and soya either singly or in admixture, all of high protein content; textured vegetable protein for use as a meat substitute; a banana-flavoured high protein cake and a simulated "liver" paste made from soy protein, fat, spices and flavouring.

In addition to these specific products, basic ingredients are being developed, such as mung bean flour, soy bean flour, defatted sesame flour, defatted rice bean flour and partially defatted peanut flour.

Various products based on local fruits have been developed including pickled, brined, and sugared fruits, fruit juices, marmalade and jams, and a product called marincider which is prepared from a mixture of ripe tamarind fruit pulp extract, syrups and flavours, and resembles non-alcoholic apple cider.

Other miscellaneous products include an instant coconut milk with a shelf life after pasteurisation of several weeks at room temperature, and a sauce prepared by acid hydrolysis of various preparations of wheat flour, coconut testa and the residues of soy bean or mung bean or coconut.

Some work on the extension of shelf life of traditional boiled fish has been carried out and a novel process for the production of fish sauce has been developed which reduces the fermentation time from 12 to 3 months.

Liaison with Industry

So far it has not been easy to interest the food industry of Thailand in the TRI products. The industry is comprised almost entirely of very small - almost primitive - manufacturers who see no point in changing their methods so long as they can continue to make their usual profits. It seems that government intervention is required either by the setting up of government-owned food

processing factories or by encouraging foreign firms to set up in Thailand. Apparently, the only sizeable food establishments in Thailand are those concerned with pineapple canning, vegetable oil refining, or armed forces food production.

2. Institute of Food Research & Product Development, Kasetsart University, Bangkok 4
Director - Dr. Amara Bhumiratana

The facilities of this Institute were originally part of the Preserved Food Organisation and although on the campus of Kasetsart University it is engaged in the actual production of novel and fortified foodstuffs right up to the packaging and despatch stage. Dr. Amara gave us a talk, illustrated with slides showing the nutritional status of the population and how his Institute was tackling deficiencies, based on his paper "How Thailand Closes the Protein Gap" to the Third International Congress of Food Science and Technology, Washington D.C. August 9th - 14th, 1970. A seminar on "Protein Food Promotion, 1972 - 1973 - 1974", was organised by Dr. Amara at his Institute November 25th - December 1st 1970. The proceedings of this seminar are to be published in Thai and English shortly but the resolution adopted by the seminar is appended hereto. (Appendix 1a).

It was evident that Dr. Amara is seriously short of professional staff, equipment and space. It was also not exactly clear why this otherwise highly commendable type of work is being undertaken on a university campus when facilities were so limited and other bodies in Thailand were also committed to a similar objective. Dr. Amara's achievements under the circumstances were most impressive. The great shortage of professional staff arises from the very low pay of university academic staff in Thailand. For example, the pay of a junior lecturer at Singapore University is no less than that of the Dean of the Faculty of Science at a Thai university and all academic staff there have at least one other job in order to be able to live! Not surprisingly, the extent and quality of the academic staffs' work at the University suffers.

3. Department of Science, Ministry of Industry, Bangkok
Visited 22nd December 1970
Director General - Dr. Manoon Praphankhadee

After a general discussion with Dr. Manoon and his senior colleagues on the place of his department's work in food research in Thailand, the various sections were visited in turn and current work discussed with the people concerned.

(a) Chemistry Section

This section is concerned with the chemistry and bio-chemistry of foodstuffs and to a certain extent with compositional analysis. The section appears to be reasonably well-equipped and relatively speaking, very well-staffed.

(b) Food Processing Section

In this section, several projects were in progress for the development of methods for the preservation and processing of local products and foodstuffs including tomato juice and paste, fish sauce, citrus products and juices, vacuum concentration and dehydration of various materials. The staff confessed the feeling of being "left behind" in relation to developments in other parts of the world, but this was not (in the writer's opinion) really justified in view of the staffing and facilities available. Any sense of inadequacy is probably more a result of lack of sufficiently clear objectives than facilities.

(c) Quality Control Section

This section is also concerned with analysis, particularly chemical analysis, and also with the establishment and determination of food quality standards.

The staff in general seems to be up-to-date, enthusiastic and able to travel at frequent intervals to establishments in other parts of the world.

4. Preserved Food Organisation, Ban Pong
Manager: Mr. Prasert Korolpis
Head of Research : Miss Charoen Valaisathien

This is a comprehensive food processing establishment built by the Thai government at a cost of some 30 million baht in order to develop and produce foodstuffs for the Thai armed services. It is completely self-sufficient including such amenities as its own steam-raising, power-generation, water supply and waste disposal facilities. It has abattoir capacity for 400 cattle/day and at least as many pigs but it is actually handling less than 1/3 of this number. Some slaughtering is carried out for the livestock owners but the majority of the meat is either butchered on site for sale to the public through retail channels or used as ingredients for canned meat products which are the most important products from the factory. The factory has its own can making and can end stamping machinery although not all sizes of cans are produced and the smallest size cans are purchased from Metal Box Co., Malaysia. Some current problems in this connection were discussed. The cans are hand-filled and check-weighed but the heat processing equipment is modern and efficient, rotary retorts being used for most of the products (including conduction packs of meat products, such as corned beef?!) A section of the factory was devoted to dehydration of meat, vegetables and fruits which were packed in plastic/aluminium laminated foils for armed forces field rations.

The general impression was of under-utilisation of the very comprehensive facilities and of the considerable potential of the establishment if it could be used economically to meet civilian requirements for processed foods including exports. It was not clear what the policy of the Preserved Food Organisation or the Ministry of Defence was in this respect.

5. Discussion with Dr. C. Lewis Wrenshall

During the extended discussion with Dr. Wrenshall, the following points emerged: -

(a) There is absolutely no food shortage in Thailand and the only nutritional problem is at the family level leading to protein deficiency in infants as mentioned earlier.

(b) Thailand is a nett food exporter but not to anything like the extent which could be achieved if appropriate decisions and proper measures were adopted. This is particularly important since Thailand's position as a major rice exporter and her dependence on rice prices are increasingly vulnerable with the greatly increased rice production in other countries which were hitherto importers of Thai rice.

(c) Much conservatism exists in the small food producing units, the small food processing firms and in domestic consumption patterns. There is some little evidence of increasing acceptance of frozen and other preserved foods and an increasing number of domestic refrigerators but the influence of this on the eating habits is likely to be slow. Indeed much of the useful work being done in certain centres is frustrated by inadequate organisation, by duplication in other centres, by lack of co-ordination between appropriate bodies and by the easy-going Thai philosophy.

(d) There are certain areas where maintenance of contact between Singapore and Thai UNIDO projects could be mutually beneficial.

(f) None of the work being done by the various Thai food research centres is of such a nature or extent as to represent an inhibiting influence on the proposed Singapore food research centre although this situation would need to be re-examined in the light of developments in Thailand over the next 5 years and more.

(g) The obvious difficulties in liaison and collaboration between relatively nearby Thai institutions themselves lead to the conclusion that effective collaboration with a Singapore food research centre is unlikely - again, unless future developments change this probability.

(h) It seems highly unlikely that the food research centres in Thailand, individual or collectively, would be competitors as a regional food research centre which is a possible future role for any Singapore food research institution which might be established.

(i) Thailand could probably benefit from the establishment of an International Agency for Food Manufacture and Marketing as proposed and outlined by the writer. (See separate document on this).

Concluding Note

This visit, although surprisingly inconclusive in certain respects, was well worthwhile in enabling the relevant activities in Thailand to be placed in perspective in relation to the Singapore food research situation and a possible food research establishment in Singapore. There would seem to be good reasons for maintaining contact with the UNIDO project at ASRCT/TRI. Unless there is a marked change in the food industry pattern in Thailand, the development

...

in Singapore of processes for upgrading Thai food products, also in Singapore, is a possibility worth keeping in mind.

(Ronald Jowitt)
UNIDO Food Processing Advisor

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4.1.71

Appendix IIIa

The Protein Food Promotion Seminar

I. Aware of the need for the development of the food processing industry in Thailand and the considerable recent advancements made here and abroad in the fields of food sciences, food technology, and nutrition, and aware of the long range benefits that the people of Thailand could derive from improved, nutritious, protein-rich, yet inexpensive foods fabricated from indigenous food sources,

Recommends

That the Government of Thailand institute the measures needed to stimulate the food processing industry in Thailand to adopt new technologies and fresh approaches in the development and commercial promotion of nutritious, protein-rich foods.

II. Recognizing that opportunity for the expansion of inexpensive, high-protein, processed food products will depend ultimately on the ample availability of suitable food crops and indigenous raw food resources,

Recommends

That the Government of Thailand :

a. Strengthen and clarify national policies pertaining to food and nutrition.

b. Carefully consider the priority needs of food and nutrition in all aspects of national and regional planning.

c. Encourage research and development and increased production of high-protein vegetable food crops with special emphasis given to soy and mung cultivation.

d. Explore ways of increasing the production and harvesting of fish and shell fish, and expand technological utilisation leading to convenient and practical preservation, processing and distribution of these foods.

e. Study the problems and obstacles inherent in the raising, transportation and slaughtering of live stock, and the processing and marketing of meat and meat products with the aim of improving the quality of these products and their general availability at reasonable prices.

f. Continue to study and promote methods for increasing the production and availability of marine resources, fowl, eggs, meat, and milk products with due regard to comparative cost relative to other sources of protein.

III. Recognizing that the most serious effects of protein deficiency occur in young children and that these damages may persist into adult life impeding the proper mental and physical growth of the individual and thereby limiting his capacity for development and productivity,

Recommends

That the Government of Thailand and its appropriate agencies emphasize and support programs aimed at increasing the protein consumption of young children, and specifically recommends :

a. The research, development and marketing of high-protein inexpensive nutritionally adequate food suitable for bridging the transitional period between breast feeding and adult traditional unprocessed foods; for want of a better term these are usually known as "baby" or "weaning" foods.

b. Expanded education of the public in the benefits derived from increased consumption of high-protein foods, and in the dangers of protein deprivation in the young child.

c. Support for the development and partial subsidy of mass supplemental feeding programs in school and preschool children, including the programs administered by the Ministry of Interior.

d. Relating nutrition activities with the existing mother and child health program in order that the mother and child will benefit.

e. Expansion of child day care centers with programs for supplementary feeding of high-protein foods for the preschool child and education of the mothers in the benefits of proper diet and good nutrition.

f. Support for programs of voluntary family planning so that each child of a family should have the opportunity for, and the benefits of, a more adequate and nutritious diet as well as the chance for education, self advancement and fulfillment.

g. Studies into the methodology and infrastructure for the preparation and delivery of foods for institutional feeding programs, considering systems such as central kitchen and distribution by catering services.

IV. Believing that the stimulation of greater investment and more innovation in the field of high-protein food processing will require, at least in the early years, a program of education, research, support, and incentives for the food processing industries to stimulate promotion and marketing,

Recommends

That the Government of Thailand:

a. Provide increased funding for relevant research in the fields of food science, food technology and nutrition.

b. Vigorously encourage and support the development of Thai institutions to introduce new knowledge in food sciences and food technology, food economics and marketing, particularly stressing development of those institutions that will extend their application within the Thai food processing industry.

c. Provide incentives to food processing firms to risk investment in the development and marketing of inexpensive protein-rich food products.

d. Support the development of a strong, viable and responsible association of food industries in Thailand to work with appropriate government agencies towards the improvement of food processing and food products, food promotion and marketing in Thailand.

V. Realizing that the proper expansion of the food processing industry will require increased vigilance and perhaps greater regulation by the government in order to protect the responsible investors from the exploiter and in order to ensure proper and economic food value for the consumer, and at the same time appreciating that over-restrictive regulation can stifle legitimate efforts,

Recommends

That the Government of Thailand:

a. Review its existing laws, regulations and standards pertaining to food, food processing, and nutrition.

b. Activate and strengthen a National Coordination Committee of Food and Nutrition and charge the committee with recommending uniform, realistic standards for foods and nutrition.

c. Strengthen the quality control mechanism of the competent services with adequate laboratory facilities and man it with the required number of trained analysts and inspectors.

d. Actively seek the participation and advice of the Association of the Food Industries in the review and establishment of standards and regulations pertaining to processed foods.

e. Establish and enforce regulations and standards for foods and nutrition that are realistic, obtainable and enforceable yet not over-restrictive to the point of interfering with legitimate, responsible expansion of food industrial sector.

-lsc

APPENDIX IV

M E M O

To: Dr. Lee Kum Tatt
Chairman,
S.I.S.I.R.

From: Mr. Ronald Jowitt,
UNIDO Food Processing Expert

Singapore Standard Specifications

Following our discussion and various other meetings on the above subject, I have set down some notes and suggestions in the attached paper. In it I do not presume to suggest what you should or should not do but what alternatives appear open and their respective pros and cons.

In your absence overseas, I am sending copies to the undermentioned since some of the points are relevant to work currently in progress.

(Ronald Jowitt)
UNIDO Food Processing Expert

Copies to :

Mr. Tan Hui-Boon, Food Laboratory } S.I.S.I.R.

Mrs. Lee-Yeong, S.I.S.I.R.

File

R. Jowitt

Mr. W. Feinberg

Mr. P. Berretti

SINGAPORE STANDARD SPECIFICATIONS

1. INTRODUCTION

It seems to be generally agreed that the drafting of Singapore standard specifications, in particular those for foods, has encountered some difficulties and the purpose of this paper is to help identify the problems and to suggest possible solutions.

It is not altogether surprising that some difficulties have arisen in the area of foodstuffs since similar problems have been encountered in other parts of the world, and nothing which follows is to be construed as criticism of attempts so far by any of the individuals involved, from whom the utmost interest and cooperation has been received by the writer.

2. OBJECTIVES

It is probably true to say that most of the more serious difficulties stem from a confusion or lack of clarity regarding the objectives of standard specifications - a not uncommon situation in other countries. It is important to distinguish between three kinds of standard :-

(a) standards of identity or performance
(b) standards of excellence i.e. "quality"
(c) standards of behaviour

2.1 Standards of Identity or Performance

By this is meant an attribute or group of attributes of a material or article which together define or are characteristic of the material or article and which can be measured objectively and quantitatively in comparison with agreed values. A specification for such a standard consists essentially of only two parts : one, the definition of the material or article which is the subject of the specification and the other, a statement or series of statements on how any given substance or article can be identified in relation to the definition. These two sections can be regarded as the definitive and determinative parts respectively. The remainder of such a specification is largely ancillary or explanatory. It should be noted that such a standard specification is quite "neutral" so far as desirability in the sence of quality or excellence or safety or legality is concerned, although conformity to such a specification is often a prerequisite of such "qualities".

To give an example, a performance standard specification could be written for a particular type of screw thread, the primary object of which is to ensure that screw-threaded components purporting to be of such a type can be relied on to mate with other components, also purporting to be of the same type, whatever their origin. Such a specification will include statements regarding the number of threads per inch, the angle of the thread cross-section, the tip and root radii, and so on, all with recommended tolerances. It does not claim to establish a minimum level of excellence nor does it explicitly or implicitly attempt to enforce a particular type of screwthread (i.e. "behaviour") on manufacturers. It is in this sense rather like a dictionary which defines what is commonly meant by a particular word. It is self-evidently desirable that if a word is used it shall have the same meaning to all users.

2.2 Standards of Excellence or "Quality" standards

Such standards differ essentially from the above type of performance standard in that their objective from the outset is to define, establish, and provide means of measuring, certain levels of desirability in the "worst, worse, bad, good, better, best" spectrum. Specifications for such standards are notoriously more difficult to produce because of the subjectiveness involved in any statement of what is good or better and because what is "better" or "worse" may depend very much on the particular context. A simple example which is apposite concerns the presence of bone in meat products. On the whole, the presence of bone in processed meat products is regarded as, if not undesirable, at least inferior by European and North American standards whereas in Asia, particularly in Chinese communities, the "best" (note the use of this word) meat is held to be that which is most closely associated with the bone.

Of course, there are some quality attributes which could probably be regarded as universal such as the freedom from "trash", "filth" or adventitious extraneous matter in general; freedom from positively harmful substances such as toxic metals, pathogenic micro-organisms, spoilage organisms, additives such as flavourings colours or preservatives known to be harmful or to be harmful in amounts greater than a certain limit, but these would normally be dealt with by suitable legislation (2.3 below).

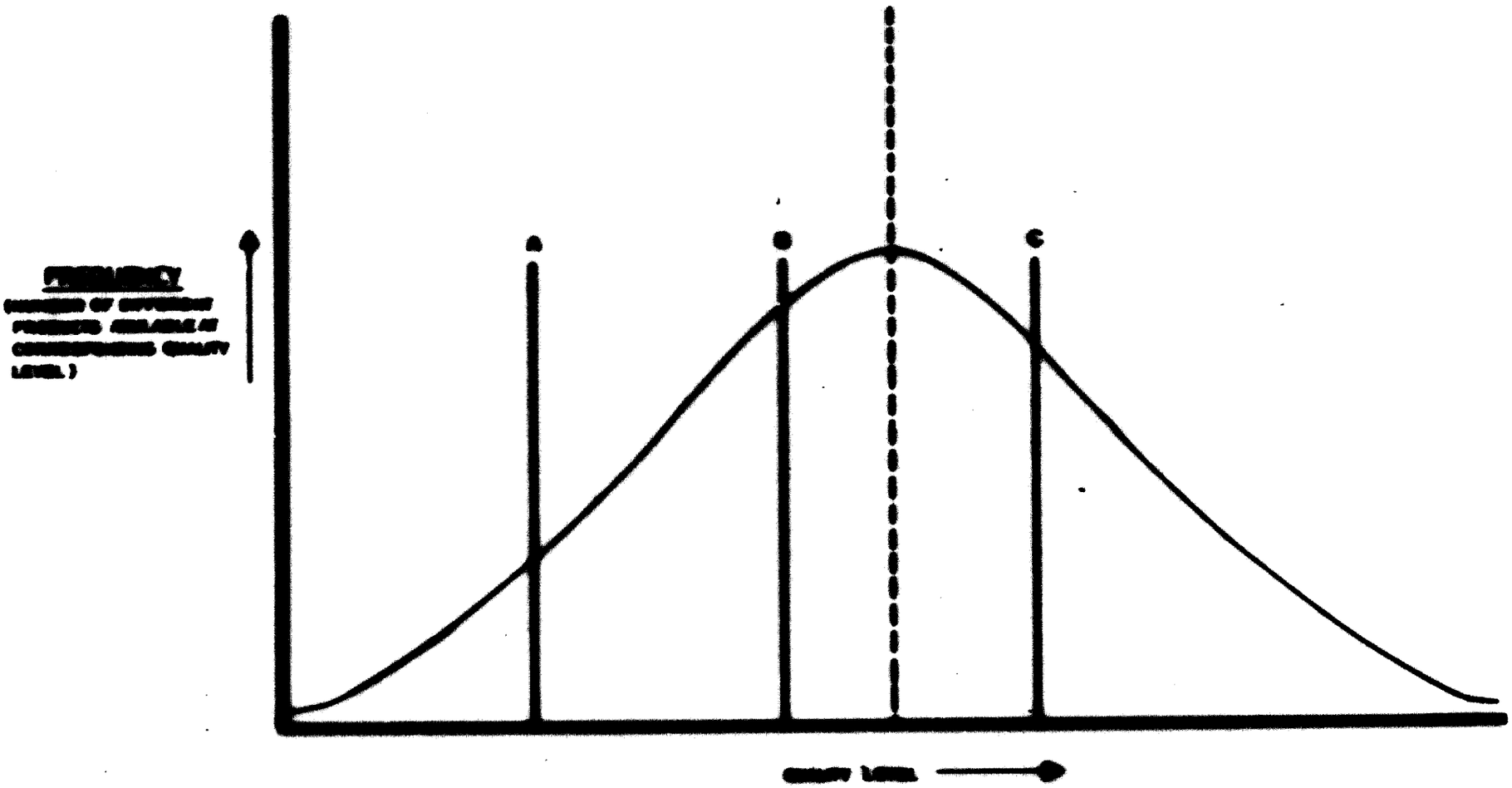
Because of the 'local' or contextual or indeed arbitrary character of standards of excellence or quality, even the term 'standard' itself is undesirable to describe a specification of what a particular substance or article should be like in order to have the required level of excellence or quality. It is not a 'standard' in the sense that a standard yard, or pound or gallon or even a standard coconut oil in the definitive sense are standards and I would strongly recommend that the term 'standard' is not applied to such specifications. Some other words such as 'code' 'good practice' - or even 'recipe' - could be used or even none at all, the document being referred to as, for example: "agreed working specification for .....".

It is worth also noting here the connotation of the word "specification". It implies first a "specifier" and secondly, someone to whom the requirements are specified the 'specifyee'. In the case of the performance standard type of specification (or dictionary definition), the relative positions of the 'specifier' and 'specifyee' are suppressed in the context of general agreement whereas in the case of a quality standard, the polarisation between specifier and specifyee is emphasized e.g. as between Buyer and Seller.

In general, both the parties to a contract benefit simultaneously from an agreed performance standard specification but in the case of a quality specification, the interests of the two parties to a contract for supply are in a very real sense in conflict since for the agreed price it is in the buyer's interests for the quality to be maximised and in the seller's interests for the cost - and usually in consequence the quality - to be minimised. The traditional view (- in England at least-) is that levels of excellence or quality are best fixed by normal market forces of supply and demand as agreed between buyer and seller. They are not a matter for group definition, certainly not for Government intervention except, of course, when a group represents the interests of one party to a contract - either buyer or seller - or when for example, the Government is also "in the market" as it were, say as a buyer.

If it is felt that this 'laissez faire' attitude is undesirable so far as the public interest is concerned in relation to, for example, foodstuffs, there is a very powerful safeguard, again as far as English Law is concerned, namely, the Food and Drugs Act, 1955 which prohibits the sale of food "not of the nature, substance or quality demanded if to the prejudice of the purchaser". Although this Act does in fact prescribe

Fig 1.



quality standards for certain goods, the real strength lies in this provision regarding the nature, substance or quality demanded.

Because of this relationship between quality and price, it should e remembered that the existence of a minimum specification for the quality of a commodity must be reflected in the price to the consumer. For example, Margarine is a valuable and cheap form of food fat, similar in many respects too, but in most countries cheaper than, buttor. In a country such as Singapore where the income of the average unskilled worker is relatively low, it is possible that the otherwise commendable activity of raising quality standards for such foods might be to price them out of the reach of the very section of the public by whom they are most needed. This is another powerful reason why quality standard specifications should be introduced only after the fullest consideration of all the ramifications and then only if essential.

One of the greatest difficulties of all is at what level to establish the specified quality standard. In a free market, with a number of suppliers the quality/frequency distribution may be expected to be Gaussian or 'normal' as in Fig. 1. This means in simple terms that there are few products of very low quality (because although possibly very cheap, they are not good enough for most people); few products at extremely high quality (because the price of them is out of reach of the average purchaser, or out of proportion to the quality needs of most people); and an increasing number of products around the average or middle grade of quality (where the most commonly-preferred balance between quality and price lies).

On introducing a quality standard specification for the product one has to decide what level of quality should be specified as desirable and it is here that the objective of the operation has its greatest effect.

The introduction of a quality standard specification has two principal effects : the first is to inhibit the production of grades below the standard; the second is to inhibit the production of grades substantially higher than the standard. The former is an intended effect, the latter an unintended and usually undesirable effect. Naturally, this effect is more pronounced on the individual sub-standard grades than on the individual super-standard grades but the more overtly the standard specification is adopted in commercial circles the greater the disincentive to exceed it.

If the objective is primarily to exclude the lowest grades which are considered too poor to exist (line A, Diagram 1), the great majority of products on the market will qualify and the more the virtues of the standard are proclaimed, the greater the depressant effect on the higher grades. In these circumstances if legislation is not desirable, it is probably better to 'play down' the existence of the quality level of the standard so far as the domestic consumer is concerned and rely on the pressure on manufacturers arising from the existence of the standard specification to eliminate sub-standard products from the retail market.

If, however, the objective is to raise the general level of quality of the range of product grades on the market, the quality level of the standard must be high in relation to the majority of the products currently being sold (lines B or C, Fig. 1) and the effects on both sub- and super-standard grades will be profound, particularly if the introduction of the standard is widely publicised at the retail purchasers' level.

The greater the efforts to influence the market through the specification, the greater the tendency will be for all products to be of that grade - no worse perhaps, but no better, either. This might be satisfactory from the point of view of the purchaser who wants just that grade but it is <u>not</u> satisfactory to all other purchasers who would prefer other grades for <u>their</u> purposes (or tastes !).

In this central matter of fixing the quality level of a specification it is important to ensure representation of points of view from all interested parties and I understand that two sections of the community have not participated in meetings on standard specification drafting. These are the smaller manufacturer and the consuming public - the "housewife" category.

Finally with regard to quality standards, an important provision could be more widely insisted upon, namely, the clear labelling and description, including the specification of ingredients, of commodities. Even in an affluent society it is, in my opinion, more important that the description of the products be clearly stated so that the customer may choose the level of quality appropriate to his requirements than that a single quality standard be enforced by moral pressure, if not by law. During one of my recent discussions on standards the remark was made that the average Chinese shoppers would invariably buy the cheapest of a range of qualities because he/she is much more interested in price than in quality. How generally true this is is no doubt open to some question, but provided the commodity is at least wholesome it would seem to be

against the public's tendencies to establish minimum quality standards significantly higher than what the public would choose. If it is felt that adequate labelling and description of goods will not adequately safeguard the interests of the poorer members of the public because of their inability to read or understand the significance of the descriptions, I would suggest that the answer lies in educating them to make sure they know the difference between what they can buy for different prices rather than depriving them of their choice as the buying public.

2.3 Standards of Behaviour

Essentially, a legal requirement in respect of a foodstuff is the specification of a standard of behaviour. An example of this is the British Food & Drug Composition & Labelling Statutory Instrument 1967 No. 1867 entitled 'The Margarine Regulations 1967' which comes into operation on 4 January 1971. Examination of this in detail will show that this does not specify the composition of margarine as such. It specifies what people may do i.e, they may sell wholesale, or to food manufacturers, margarine of the first-mentioned composition but if someone sells something called 'margarine' retail, an offence is committed if the margarine does not satisfy the second specification. It does not prohibit the manufacture or possession of margarine outside either specification and, of course, it would be ludicrous to do so. In my view, one reason why there are so few food specifications in countries such as Britain is because the public is safeguarded by Laws such as these which concentrate not so much on establishing a quality standard for a product but, in regard to certain kinds of product, what may or may not be done by persons. On page 3 of the Statutory Instrument No. 1867, the clauses commence :

"Any margarine sold, consigned or delivered ..... "

5. (2) 'No person shall sell, consign or deliver .....'

6 (1) 'Any margarine sold by retail shall contain ....'

6 (2) 'No person shall sell by retail any margarine ...'

7 (1) 'No person shall sell any food under such a description as to lead an intending purchaser to believe that he is purchasing any margarine .....'

7 (2) 'Where a person sells any food to a purchaser in response to a request for any kind of margarine for which compositional requirements are specified in these regulations, he shall be deemed to sell margarine of that kind and conforming to the compositional requirements for margarine of that kind which are specified in these regulations in relation to that margarine, unless he clearly notifies the purchaser at the time of sale that the food is not of that kind.

8 'No person shall give with any margarine sold by him any label, whether attached to or borne on the container or not, or display with any margarine offered or exposed by him for sale any ticket or notice, being a label, ticket or notice, as the case may be, which ..... etc.'

This 'approach' is a very important aspect of Law which I feel has not been fully appreciated in the production of Singapore's standard although it has been clearly stated that such standards will be advisory and not enforced - at least initially.

3. [redacted]

A quite vital aspect of any kind of standard specification is the extent to which the requirements of the standard specifications have been complied with. In the case of a Performance Standard Specification, in my opinion the sequence should be :

What are the definitive attributes of this substance ?
How can we measure them objectively ?
At what level and within what limits are these attributes to be set and why ?

A customer may specify that a particular consignment shall originate from a particular district or source and the supplier may be required to give proof that his requirement has been met but, although a standard specification might refer to the source or origin of a material or an ingredient, this is of little weight if there are no known means of determining, by examination of the material, that it has so originated. For example, it is possible to assess by analysis the proportion of a fat mixture which has probably come from milk and so a specification stipulating the proportion of milk fat in a product may be verified both at the time of compounding by supplier and also at any time after delivery by objective analysis. But there is little

point in a standard specification (as distinct from a purchaser's specification) stipulating, say, that a particular grade of butter come from mastitis-free cows if there is no means of examining the butter so as to determine whether such was the case !

A further point regarding the determinative aspect of standard specifications is that a particular test or level should not be specified simply because it can be carried out. There should be clear, agreed reasons why the product should be tested for a particular attribute and for the levels and tolerances chosen. Furthermore, it is not appropriate to stipulate 'absolutes' because of the impossibility of their determination ! Whether a particular fat is "free from rancidity" depends on the sensitivity of the palate of the examiner because there are, I believe, as yet no satisfactory methods of measuring rancidity as such but even if there were, it would not be satisfactory to specify the rancidity as 'nil' because each time a more sensitive method of determining rancidity was discovered, the manufacturing stringency would automatically increase. It is however acceptable to specify that the presence or absence of a particular attribute as measured by a particular technique shall be confirmed, since the definition of what is meant by 'nil' is implicit in the stipulation because of the specification of the method of test.

Some draft Singapore Standard Specifications have contained a clause specifying that the product shall comply with the relevant Singapore Food and Drugs Regulations, or other words to the effect that they shall meet the requirements of the law. It is SISIR's intention to issue certificates declaring that certain approved products comply with the relevant Singapore Specification. If subsequently the product or some sample of it is called into account in respect of some aspect of the law, the manufacturer could reasonably claim indemnity by virtue of his SISIR certificate and SISIR could find itself co-defending the action. It would therefore be advisable to delete such clauses and even include a statement such as "nothing herein shall be construed as being in conflict with, or offering exemption for any party from the normal processes of, the law." (Although personally I feel that simple omission of the original clause sufficient and preferable. It is not the job of a Standard Specification to require conformity to the law of the land, and to omit such a requirement cannot be regarded as an invitation to break the law !)

Recommendations

1. A clear, detailed policy statement on the general objectives of Singapore Standards Specifications would enable those required to draw up Specifications to do so more effectively and unambiguously.

2. Before a Specification is drafted a specific "Statement of Objectives" for the article or commodity in questing should be prepared and agreed between those concernod and it should be the duty of one person to ensure that
   (a) All the objectives are included
   (b) All the objectives are valid
   (c) All the objectives are compatible

3. Singapore Standard Specifications should be confined to standards of identity or performance. If so-called standards of quality or excellence are considered necessary, they should be clearly distinguished as such, given a description which does not include the word "Standard", and drawn up with due regard to the dangers and difficulties involved.

4. If a law already exists specifically referring to a product for which additional requirements are proposed, consideration should be given to amending that law rather than introducing a 'Specification' for the material in the 'Standard' sense.

5. Rather than draw up a single Standard Specification which will inhibit production of grades of the product above and below the standard specified, SISIR could consider a system of certification based on the manufacturer's <u>own</u> specification, reserving the right <u>not</u> to issue certification for qualities below a certain desirable, if not mandatory, minimum.

6. As a variant of this system, SISIR could consider evolving a quality grading system applicable to all kinds of products such as :

   <u>one star</u> : wholesome, safe, acceptable and within the generally accepted minimum requirements for such products.

   <u>two stars</u> : wholesome, safe, acceptable and above the generally accepted minimum requirements for such products.

three stars : wholesome, safe, very acceptable and well above the generally accepted minimum requirements for such products.

four stars : wholesome, safe, most acceptable and with high ratings for all the generally accepted minimum requirements for such products.

five stars : of the highest known quality for such products; among the best of its kind. Excellent in all respects.

7. Standard Specifications and quasi-standards should be as brief, as simple and as clear and unambiguous as possible.

8. Provision for arbitration in the event of dispute over the interpretation of the Specification might be worthwhile.

9. The **definitive**, the **determinative** and (if in duo course adopted) the **regulatory** functions must be, and must be seen to be, carried out by **different** bodies truly independent of, and free from the possibility of undue influence on, each other. That is, the standards must be drawn up by one body; the test for conformity must be carried out by a second, independent body; and any regulatory action must be by yet a third independent body. (corresponding roughly to Parliament, the Courts, and the Police respectively !).

(Ronald Jowitt)
UNIDO Food Processing Expert

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APPENDIX V

To: Tan Hui-Boon,
Ag. Director, LIS

From : Ronald Jowitt,
UNIDO Food Processing Expert

The attached note was written following discussions with Mr. Tan Kim Piau regarding Pioneer Testing of Malacca and there appear to be certain questions needing clarification and action. I shall be happy to discuss this further at your convenience.

(Ronald Jowitt)
UNIDO Food Processing Expert

Copies to : R. Jowitt
Tan Kim Piau
Chow Beow Man
Keng Joo Hin
Victor Chow
Food Lab. (2 copies)

RJ/ee.
20.11.70

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20.1.71

A Note on the Pioneer Company Product Testing and Certification

Some problems have arisen regarding the nature extent and manner of examination of pioneer company products in accordance with sub-section (e) of the conditions specified on the pioneer certificates. This requirement specifies that the products shall be tested by SISIR or other approved laboratories as and when required by the Government, but it does not specify what attributes shall be examined nor does it give any indication as to the manner in which the attributes to be measured shall be arrived at. It would appear that the most satisfactory solution to this problem would be for the attributes to be clearly specified at the time of the granting of the pioneer certificate. This would not be unreasonable because the Company could be requested to indicate those attributes of the product which could reasonably be claimed to qualify for pioneer status. It would then obviously be these attributes which would be examined in order to certify the satisfaction of the pioneer status requirements.

For products the subject of existing pioneer certificates, however, it still remains to be decided how the products are to be examined. It is suggested that where several manufacturers are producing similar products, each Company be approached to ascertain what they themselves would consider reasonable and desirable aspects to be assessed and that SISIR (or LIS acting on their behalf) then draw up a list of attributes, minimum levels, methods of test, etc. for the particular kind of product and then to indicate to all the manufacturers that this is the proposed scheme for assessment. Som of the manufacturers might wish to object to some aspects of the proposed testing schemes and if necessary in order to reach agreement, a joint meeting with all interested parties could be held. It is important not to specify attributes which are irrelevant or unreasonable but to include such attributes as seem generally desirable for a product (a) of this type and (b) enjoying pioneer status.

The example which has given rise to this note concerns nutritious instant food beverages, in particular, Milo (Nestle), Ovaltine (Wander) and Maleoa (Allied Chocolate Industries). The last named Company, in response to a request for specification in this connection, have replied simply quoting maximum moisture and total fat content. The Label on the can however, specifies several minerals and vitamins as being present without reference to the amounts, which is clearly unsatisfactory particularly as one of the vitamins specified is 'C' which is unlikely to be present (if at all!) in any significant quantities.

APPENDIX VI

[redacted]

Ronald Jewitt
UNIDO Food Processing Expert

Singapore, January 1971.

1. SUMMARY

The present state of food development work in Singapore, the probable future needs there and in the region, and the special position of Singapore in S.E. Asia justify the establishment, with UNIDO assistance, of a Food Development Centre in Singapore. Such a centre would presumably be sponsored initially by the Singapore Goverment with UNIDO help but the maximum participation by the Singapore food manufacturers is felt to be essential if the work of the Centre is to find practical application in food product and process development. An important task for the early stages of the project would be to cultivate the interest and participation of Singapore food manufacturers.

Two distinct areas for food development exist in Singapore - preservation and conversion - and these require rather different approaches.

One of the most serious obstacles to progress anticipated is the shortage of skilled, experienced professional staff from the area itself. The Centre will therefore need to be strongly competitive in terms of remuneration and personal benefits as well as in job satisfaction. Non-Singaporean senior staff should be employed, in addition to any attached U.N. personnel, for such periods as may be necessary until a body of competence and experience is built up within the Centre itself.

For these and other reasons the most important single thing for the Centre to develop is its own reputation. It will probably have to start in a small way at first but a small group with a high reputation could succeed whereas a larger group, staffed for the sake of filling posts with titles would certainly fail.

Accordingly, the scale of the proposed project is modest but this reflects the practicalities of the situation; the need for such a Centre is not thereby diminished.

2. INTRODUCTION

2.1. Industrialisation of food preservation and conversion is a normal consequence of urbanisation and general industrialisation. It is not an inevitable consequence however, and certain aspects of Singapore conditions indicate the need to consider carefully the extent to which food industry development there may be safely assumed to follow similar lines tothose in other urbanised/industrialised societies.

With certain notable exceptions Singapore is not, and is not likely to become, a primary producer of its food requirements. It will continue to import the bulk of its food and whether this is in the fresh or preserved state will depend on the relative availabilities of both forms and on the strength of preference for either by the people of Singapore.

Because of its size, fresh food distribution is not a problem in Singapore and although future social changes might lead to the working housewife and the disappearance of cheap domestic labour and so affect the current practice of personal shopping in local markets, the level of Singaporean discrimination and interest in quality food could result in fresh food retaining indefinitely its predominance in the dietary pattern despite general industrial development, provided the people realise they have the choice and are prepared to pay for it.

There is no case for the planned replacement of the present fresh food consumed in Singapore by Singapore-processed foods. If processed food directly replaces fresh food it will be because the latter is unavailable or excessively expensive and so the imported food would become processed food. If imported fresh food is to be processed in Singapore it will be mainly for export to the region or to more distant affluent areas of the world. In neither case need fresh food be imported and processed commercially in Singapore for the local market to any significant extent.

A further obstacle to substitution of fresh by processed food would be the technological difficulties involved in reproducing in the latter the organoleptic properties - in particular texture - of the former without which the food would be rejected by the consumers in Singapore.

In summary, such a change would be both unwelcome and extremely difficult to bring about : it is therefore so much less likely to occur.

2.2 Whilst the above refers to food preservation, the picture is quite different for food conversion, i.e. the production, industrially, of foodstuffs profoundly different from the food materials from which they are made. Examples include flour confectionery such as bread, cakes, noodles, and biscuits; vegetable oil and products such as margarine; soya sauce; fish sauce; sugar; and beverages including dairy products reconstituted from imported materials.

In all these cases the customer quite happily buys the manufactured product which never purports to be a preserved substitute for a fresh equivalent. He might well be as discriminating in his choice of brand and quality as in his choice of fresh foodstuffs but he never feels it necessary to reject all manufactured brands and make the product himself at home. In this the industrial product is firmly established in Singapore - in manufacture and consumption alike. Already exports have been established in this field and investment to produce more such exports is progressively increasing in Singapore.

An awareness of the need to compete in world markets and of the elements of such competitiveness - manufacturing efficiency, quality control, economies of scale, international promotion, collaboration agreements and licensing of new processes - already exists in Singapore along with an appreciation of their own strengths, weaknesses and needs - at least in some of the companies concerned.

2.3 A third and less important area is that of local manufacture of foodstuffs originating elsewhere, in particular in the West. This includes chocolate and sugar confectionery, ice cream, international carbonated beverages ('Coca-Cola', '7-Up' etc.), bed-time beverages ('Ovaltine', 'Milo' etc.), and instant coffee and tea powders. Although less important than the above two areas - and it could be considered as part of the general field of converted foods - it is not necessarily insignificant in future development of food processing in Singapore. However, the drive and know-how behind such products invariably tends to come from the country of origin and not from local sources.

2.4 The Singapore food industry comprises three broadly different kinds of enterprise :

(a) a few relatively large, modern firms of external origin often with expatriate staff and foreign capital

(b) a few relatively large local firms of Singapore or S.E. Asian origin with local or regional capital, management and staff

(c) A large number of relatively small firms mainly concerned in traditional small-scale manufacturing or preserving operations for local or immediate area export markets.

2.5 Singapore is currently undergoing deep and far-reaching changes in its social, industrial and economic life. These changes are occuring so rapidly and on so many fronts that it becomes difficult to foresee what pattern will emerge when the present impetus dissipates, especially since not all the consequences of planning by various Government Departments, and their interactions, can be foreseen.

This affects food manufacture in two basic ways. Firstly it affects what Singaporeans will eat, where, how and at what cost. Secondly it affects the nature and viability of commercial/industrial enterprises in Singapore and hence the type, size and scope of food firms which will survive or arise - as well as the relative attractions of food manufacture compared with other manufacturing activities open to entrepreneurs.

2.6 The Food Laboratory of Light Industries Services of the Economic Development Board of Singapore was transferred from EDB to the Singapore Institute of Standards and Industrial Research on 1st January, 1971 and is now reviewing its objectives and future development in relation to the future development of the food industry in Singapore. It expects to concentrate on product and process development and on consultancy services to industry.

2.7 The Primary Production Department food laboratory is extending its interest to processed primary products such as canned and dehydrated meat and vegetables, assisted by F.A.O. Although initially veterinary in character it has declared its intention to extend its scope to cover all stages of processing and to equip its premises with laboratory-scale and pilot-scale food processing equipment. Considering the existing facilities of the SISIR Food Laboratory and the industrial context of food manufacture in Singapore, such duplication of effort and the absence of appropriate liason and consultation in such a small country is regrettable and should be remedied. Harmful fragmentation is all too common in other countries' food research organisations and firm, positive and urgent steps should be taken to prevent its development in Singapore.

3. THE CASE FOR A FOOD DEVELOPMENT CENTRE IN SINGAPORE

3.1. Ignoring for the moment the question of size, the reasons for establishing a Food Development Centre in Singapore could include one or more of the following :-

3.1.1. The encouragement of cooperation at the technological level between food manufacturers themselves and between them and a Government-supported centre, in the interest of Singapore's economy, the food of the people and the industry's general development. To provide a focal centre for food development in Singapore and possibly, later, in the Region.

3.1.2. The development of improved industrial products and processes in the existing converted food field in Singapore so as to increase competitiveness in export markets.

3.1.3. The study of developments in food processing elsewhere so as to provide a pool of 'current awareness' available for application to food processing in Singapore.

3.1.4. The study of local foods and means of presenting them in preserved or converted form to new external markets.

3.1.5. The scientific study of traditional local processes in order to understand the principles involved and be better able to improve and modernise them.

3.1.6. The study of the effects of both local traditional processes and also modern industrial processes on the quality, acceptability and nutritional properties of local foods, including the current and probable future nutritional status of the community.

3.1.7. The study of local foods so as to determine the components of their particular organoleptic attractions, and hence means of improving them and facilitating 3.1.5. above.

3.1.8. The study of selected foods important elsewhere so as to determine the desirability and feasibility of their production in Singapore.

3.1.9. The study of selected food markets overseas to facilitate profitable export of Singapore food products to, and their acceptance in, those markets.

3.1.10. The study of food production and processing patterns in S.E. Asia so as to provide an area-wide appreciation of possible developments in the Region on behalf of Singapore in the first instance but possibly later on behalf of the Region itself.

3.1.11. To provide consultancy services to food manufacturers initially in Singapore and possibly later to enquirers in other countries, near and distant.

3.1.12. To undertake bench- and pilot-scale development of products and processes on behalf of industry.

3.1.13. To organise technological seminars and symposia on food processing topics relevant to Singapore and the Region.

3.1.14. The anticipation and prediction - and influencing - of future developments and trends in food processing in Singapore and the Region.

3.2. Since all or most of these are desirable objectives the question is simply whether an organisation of minimum practicable size could profitably pursue some or all of them, and what that practicable size is. An important factor in this consideration is the relationship of the Centre to other private and public organisations.

3.2.1. If the Centre and its work is to receive complete acceptance by the industry the possibility of polarisation between Centre and Industry must be avoided. The most certain way of ensuring this is to obtain the actual participation of industry in the guidance and policy-making - and if possible the funding - of the Centre. In this respect it would differ from existing Singapore institutions and would resemble more the co-operative Research Associations typical of industrial/government collaboration in specific areas of manufacture in, for example, Britain. To take a typical (and apposite) example, the British Food Manufacturing Industries Research Association (BFMIRA) is an independent applied research institution governed by a Board and managed on its behalf by a Director of Research who is the executive head responsible for all the affairs of the R.A. The Board consists of representatives from industry, government, academic life and other appropriate sectors and

determines the general policy, programmes, structure and financial principles of the R.A. The R.A. itself is organised to suit the needs of the industry, the available staff, the strategy of the Director, and the funds available.

Membership is open to food manufacturing and similar firms; associate membership to interested organisations e.g. on the fringe of the industry. Members pay annual subscriptions according to their size or profitability or turnover and associate members (whose privileges are less than those of full members) pay a more nominal subscription. The Government then makes additional payments related to the amount of membership subscriptions. Special projects call for additional subscriptions from those members particularly interested in the results of the projects and, depending on how much the project is felt to be in the national interest, pro rata Government grant is added to the project fund at a variable ratio ranging from, say 0.5 to 2 times the private sectors' contributions. (The actual formula is more complicated, in practice). The separate projects and also the different regular sections of the R.A.'s work are headed by a senior scientific staff member and guided by panels or committees preponderantly made up of representatives of appropriate members with occasionally a government representative.

Many advantages (and some disadvantages) accrue from the duality of interest, control and funding of these R.A.s but their success provides a precedent for the suggested cooperative basis of the proposed Food Development Centre.

3.2.2. Two desirable features from Singapore's point of view are the greater freedom of action or flexibility of organisation and the ability to fix remuneration independently of any national scales, which is important in view of differences between different sectors of industry. (A common superannuation fund - the Federated System for Superannuation in Universities, FSSU - is used by all R.A.s in the U.K. to facilitate transfer between R.A.s and also from R.A.s to Universities and conversely The Singapore Central Provident Fund would clearly provide this same facility on an even wider scale.)

3.2.3. Criteria for the success of such organisations are firstly, the extent to which the industry problems are solved and its future development assisted; secondly (and consequently) the breadth and depth of support secured from the industry and, pro rata, from government; thirdly the calibre of direction and staff it can procure and the Corporate reputation it achieves; fourthly the consequential financial support the above criteria attract to the R.A.

3.2.4. The size of R.A.s varies widely but, essentially, there must be a director, clerical support and at least one professional worker with technician assistance. This minimum would enable one or two projects to be undertaken at any one time, at the most.

4. THE SCOPE AND ACTIVITIES OF SUCH A CENTRE

4.1 The declared scope and activities of the Centre will differ from the actual work to an extent depending on the available competent staff and facilities. Competent staff with inadequate facilities will work inefficiently, and not for long; inadequate staff with excellent facilities will not work at all and will destroy the confidence of the industry for long into the future.
The controlling limitation will therefore be at all times the calibre of staff in the Centre and the work programme must therefore be limited accordingly. However, assuming that sooner or later adequate staff and facilities will be forthcoming the scope and activities of the Centre should be as implied by the examples given in the preceding sections 3.1.1. to 3.1.14 viz. :-

4.2 "The development of products and processes relevant to the food manufacturing industry of Singapore and S.E. Asia generally, and associated supporting activities."
By 'associated supporting activities' is meant any development activity to meet a need existing or anticipated in the industry for which a solution is not otherwise available.
'Relevant to the food manufacturing industry' provides also for activity which might not actually involve food itself but which is important to the food industry in the Region and which is not already provided for otherwise.

4.3 Unless widespread substantial support from the food industry is secured by the date the Centre is established, one of its first priorities should be to secure the support and involvement of the industry in the affairs of the Centre 'from the inside' as it were, making it quite clear from the outset that although financial support might not be forthcoming initially, the objective is for the industry in due course to feel satisfied that the Centre is a worthwhile investment for its subscriptions and that it is enlightened self-interest to participate fully. This will not easily be done by speaking in generalities and will require at least a few specific projects of common interest and of importance to as a large a number of firms as possible to be proposed. The selection of such projects should be made at an early stage, desirably in consultation with food manufacturers. One which appears to be of general

interest is the development of quality control systems to suit the needs of the local food manufacturers. Others might be: the development of a system of hygienic principles to be adopted by local food manufacturers; a generally applicable scheme for economising in water and the disposal of effluents from food factories, and packaging problems common to a group of firms.

4.4 It is suggested that the Centre be organised on the basis of project areas bearing in mind staffing questions at the outset. Initially two key posts directly under the Director would cover respectively Converted Foods and Preserved Foods.

4.4.1. The Converted Foods Section would be by far the most important in scope for some time to come and would include topics in :-

(a) Vegetable oil extraction, treatment, refining, modification, hydrogenation and blending; derived products; applications and end uses; handling, distribution, storage, packaging and dispensing.

(b) Sugar production, extraction, refining, grading, handling packaging and modification; by-product uses; applications and end uses (e.g. jams, preserves, sweets) (In conjunction with Prof. Kelly's work at Singapore University).

(c) Soya sauce production; evaluation of traditional processes in terms of operative principles; experimental process variants to improve productivity, uniformity of quality; evaluation of constituent quality components.

(d) Fish sauce production; (as for (c) above)

(e) Lard. This locally-produced animal fat is of sufficient potential importance to warrant study along similar lines to (a) above

(f) Cereal products based on wheat, rice and other flours; bread and cakes, biscuits, noodles.

(g) Beverages: tea and coffee powder; carbonated and uncarbonated drinks; bed-time drinks; chocolate and milk-based drinks; reconstituted filled and flavoured milks; coconut-based liquids, creams and derivatives.

(h) Ice cream, water ices, frozen desserts (product and process studies).

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4.4.2. Obviously not all such topics could be tackled at once but the task of the head of the Converted Foods Section would be to evaluate, in conjunction with industry if possible, which topics should be given priority.

4.4.3 Preserved foods fall naturally into a different category in Singapore for reasons already discussed. The head of this section would need to consider :

(a) developments in food preservation techniques of potential application to Singaporean, Chinese or S.E. Asian foods (quick frozen Malayan Satay has recently appeared on the market)

(b) the characteristics of local speciality foods from the point of view of their suitability for preservation for export.

(c) trends in food products and food habits in likely customer areas so as to identify probable markets for preserved local products or completely new products using local materials or experience.

(d) existing foods already being preserved locally and the scope for improving their competitiveness in world markets; analysis of their strengths and failings.

4.5 The director and the two senior technologists referred to above along with supporting office and laboratory staff constitute the minimum practicable team for a viable Food Development Centre. Thereafter, expansion would be in one or more of three directions :-

(a) Appointment of supporting technologists within the Converted or Preserved Food Sections responsible for designated parts of the work of the Section. For example a technologist specialising in oils and fats production and application could be delegated responsibility for 4.4.1. (a), (e) and parts of (g) and (h). A canning or dehydration specialist could undertake those aspects of the Food Preservation Section's work.

(b) Specialist staff could be appointed to provide a contribution of importance to both major sections, for example a food engineer, a packaging technologist, and so on.

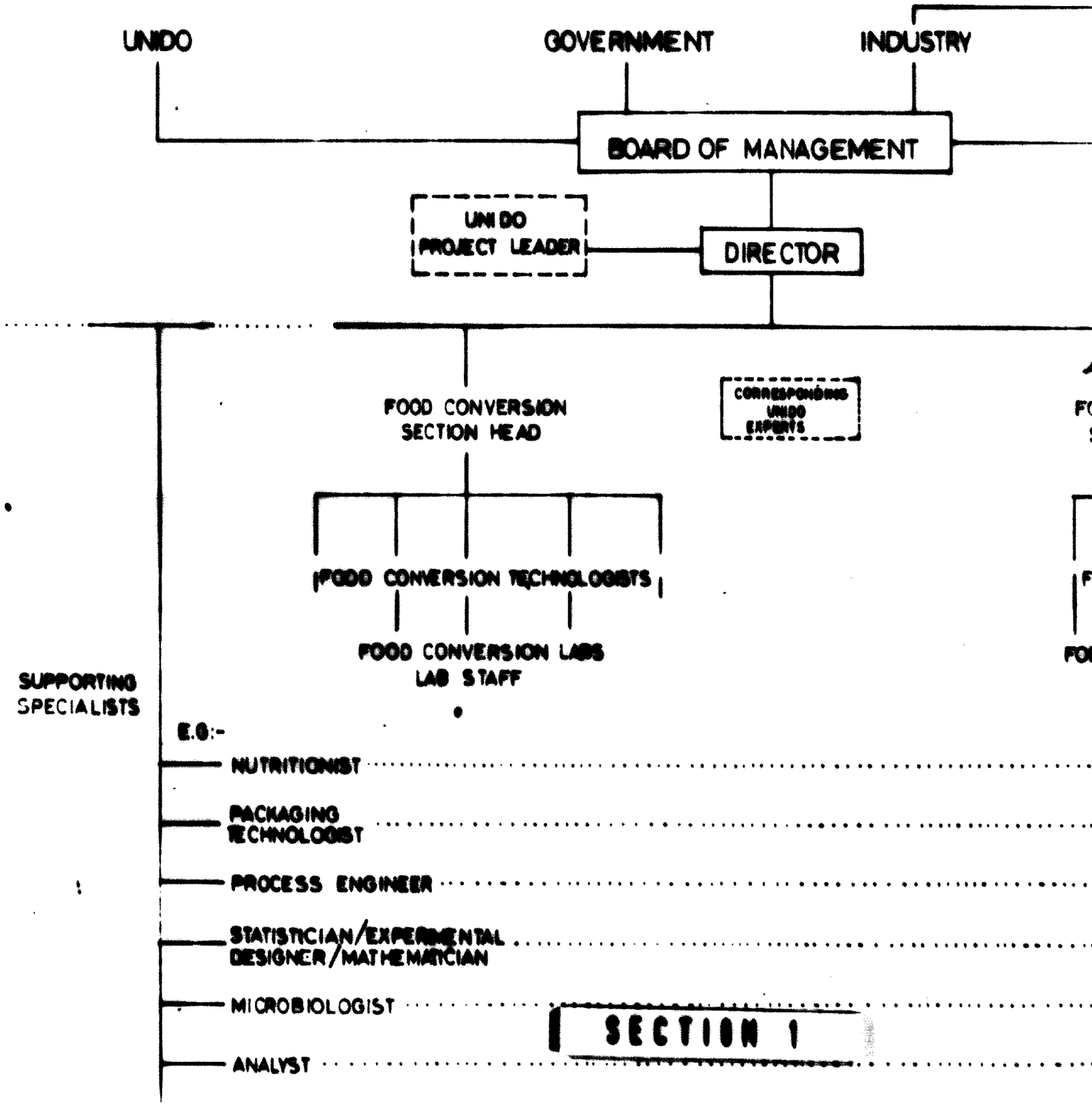
Cont'd...

(c) new, separate but related functions could be initiated by specialists in, for example, liason, consultancy and advisory services to member firms; library, documentation and information services, etc.

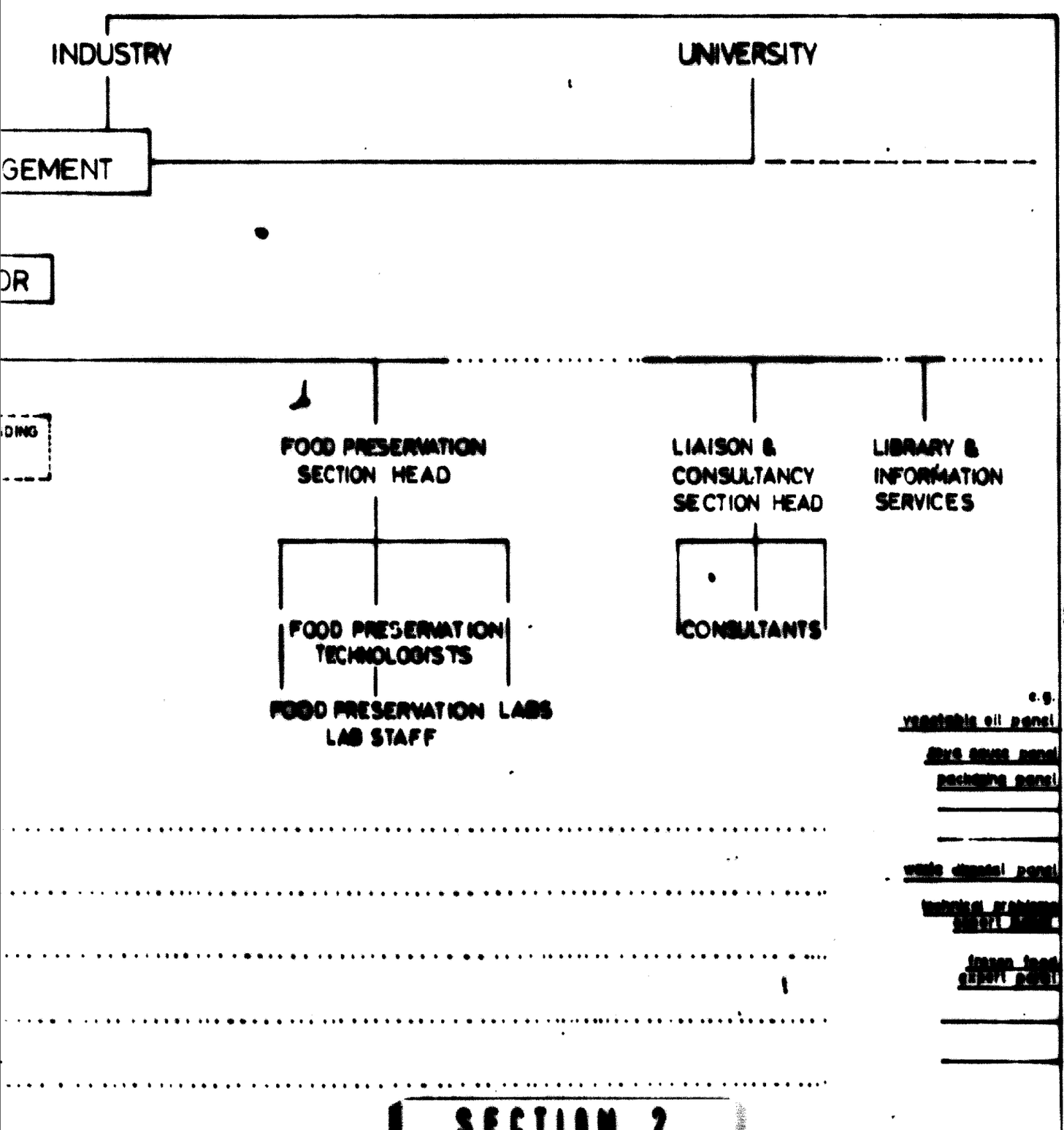
Naturally, some of the functions referred to in (a) - (c) above would have to be provided even if there were no designated individual responsible. Then it would rest on the Director or the Section Heads to ensure that the necessary contribution was made available. For instance the Director would bear most of the responsibility for liason with the industry and hence be also involved in consultancy and advisory work. Similarly, certain experimental work might need to be subcontracted pending acquisition of suitable facilities at the Centre.

4.6 In many of the above respects the F.D.C. would continue and extend the work of the SISIR Food Laboratory and it would be natural for it to form part of the basis for the new Centre, to the extent that its present character, abilities and affiliations permitted. However simple extension of the work of the Food Laboratory would not enable some of the important objectives referred to above to be attained.

SINGAPORE FOOD DEVELOPM
SCHEMATIC DIAGRAM OF SUGGES



DD DEVELOPMENT CENTRE
OF SUGGESTED ORGANISATION



SECTION 2

R.J./JAN 1971

PROPOSALS

5.1. It is proposed that a joint Singapore/UNIDO project be initiated at the earliest opportunity to establish a Food Development Centre in Singapore with the scope and objectives outlined above, (particularly in 4.2.) and that although financed initially as detailed below from UNIDO and government funds, should be controlled by a Board representative of both the Government and the Singapore Food Industry. The Singapore Food Industry, through their Trade Associations, has indicated its willingness in principle to participate in such a project and accepts, again in principle and without commitment that ultimately the industry could be expected to provide a substantial financial contribution to the costs of the Centre, although the ways and means for such a contribution must remain open for the present time.

5.2 A suggested scheme of organisation is shown in Diagram I opposite.

5.3. It is recommended that the respective UNIDO/Government contributions and the size of the project be as indicated in Table I which provides for an initial three year programme to be followed if approved after review, by a further two year programme.

Table I. Summary of Provisional Project Costs (US$)(three year programme)

Purpose	Singapore contribution	UNIDO contribution	Details in Table
U.N. Expert Staff	-	192,000	II
Singapore Staff	172,540	-	III
Followships for Staff	-	16,000	IV
Premises	147,000	-	V
Equipment	-	40,000	(see note below*)
	319,540	248,000	

Combined Total : 567,540 US$

* Equipment: Mainly extensive food pilot plant and laboratory equipment already exists in the SISIR Food Laboratory. If this is incorporated in the proposed F.D.C. the additional equipment to be purchased should reflect the changes in emphasis e.g. on food conversion. Food processing should be well provided for initially by the existing equipment. If this equipment is not, or not entirely, available for the F.D.C. the purchase list will change accordingly. For this reason an arbitrary sum of US$40,000 has been included for the purchase of at present unspecifyable equipment.

TABLE II

UNIDO experts recommended for the Singapore Food Development Centre

(Contribution by UNIDO)

Specialisation	Total manmonths	Estimated Cash Disbursements (US$ p.a.)			Total Cost
		Year I	Year II	Year III	US$
Project Manager	36	24,000	24,000	24,000	72,000
Food Conversion Specialist	36	24,000	24,000	24,000	72,000
Food Preservation Specialist(s)*	24	24,000	-	24,000	48,000
	96				192,000

* This post could be a split assignment or two separated assignments by different individuals

TABLE III

Tentative Provision of Staff
Singapore Government Provision

Staff	Total (manmonths) (basis)	Estimated Cash Disbursement (US$)			Total Cost US$
		Year I	Year II	Year III	
Director (1)	36 ($2,200)	9,600	9,600	9,600	28,800
PA to Director (1)	36 ($ 600)	2,400	2,580	2,700	7,680
Sr. Food Technologists (2)	72 ($1,000)	15,840	15,720	16,080	47,640
Food Technologists (5)	108 ($1,200)	9,600	14,280	15,360	40,080
Asst. Food Technologists (2)	72 ($ 800)	6,480	6,720	7,080	20,280
Lab. Technicians/ Assistants (5)	108 ($ 400)	4,800	8,760	9,480	23,040
Lab. Attendants (5)	72 ($ 180)	1,800	1,800	1,800	5,400
					172,520

Notes :

1. Recruitment to be strictly subject to availability of high calibre staff only
2. Local salaries are computed inclusive of retirement benefits and are based on Civil Service rates for budgetary and not for determinative purposes

Table IV

Fellowships Proposed for the Singapore Food Development Centre Staff

	Total man-months	Estimated Cash Disbursement(US$)				Total Cost (US$)
		Year -1*	Year 1	Year 2	Year 3	
Director	6	4,000				4,000
Food Technologists (4)	24	3,000	3,000	3,000	3,000	12,000
	30					16,000

* i.e. to be taken before the date of actual establishment of the F.D.C.

Table V

Proposed Initial Space requirements for Food Development Centre

Purpose	Singapore Government Contribution Area (ft^2)
Director's office	300
Section heads offices(2)	400
Food technologists (3) work-rooms	600
Assistant technologists (2) work-rooms	300
Food conversion laboratory	3,000
Food conversion ancillary laboratory	600
Food preservation laboratory	2,000
Food preservation ancillary laboratory	600
Microbiology laboratory	600
Storeroom	600
Total :	11,000

Cost of building = US$10 per sq. ft.

Area of actual use = 11,000 sq. ft.

Factor for corridor space based on area for actual use = 1/3

∴ Total cost of building = US$(4/3 x 11,000 x 10)

= US$147,000

Job Description: Project Leader

Duration: 3 years

Date required: January 1972

DRAFT

Duty Station: Singapore

The Project — Food Development Centre

In order to promote the development of the Singapore Food Industry the Singapore Government, with UNIDO support, is establishing a Food Development Centre which will incorporate the work and some of the facilities of the existing Food Laboratory of the Singapore Institute of Standards and Industrial Research (SISIR). The support and participation of the Food industry is assured and the programme of the Centre will be to develop products and processes of particular relevance to the existing and future activities of the local food industry. Particular emphasis will be placed on conversion processes for foodstuffs (see explanatory note below*), on specialty preserved food products for export and on consultancy and other direct services to the local food industry. It is hoped that the work of the Centre will be such as to gain for it international eminence in due course.

Duties

The duties of the project leader will be to represent the interests of UNIDO in relation to all aspects of the project; to guide and advise the Singapore Government and the Board, Director and the staff of the Centre; and to head the team of UNIDO advisers attached to the project. He will be the UNIDO representative on the Board of Government of the Centre.

*(Food conversion is that area of industrial food processing in which the product is profoundly different from the starting materials. It includes such operations as sugar refining, vegetable oil refining, flour, chocolate and sugar confectionery manufacture, bread, cakes, biscuits and needle production, fermented soya and fish sauce manufacture. It is distinguished for the purposes of this project from food preservation in which the primary objective is retention of the original attributes of the starting material)

Qualifications & Experience

A good Honours degree or equivalent in the natural or applied sciences with substantial postgraduate experience in both the execution and management of applied technological research and development. Some of this experience should desirably have been in food product or food process development. Wide industrial experience in food processing, preservation and conversion is also desirable. Candidates with previous experience in industrial consultancy who have previously held a U.N. field appointment and have first-hand knowledge of S.E. Asia would be especially suitable. The post although technical, requires administrative ability and the ability to get on successfully with people in this area.

Language

English

Background Information

Singapore is developing rapidly as an industrial centre but its food supplies are still mainly fresh, and of high quality. There is little case at present for their replacement by locally-preserved foods.

There is however a growing food conversion industry using imported raw materials from the region and one aim of this project is to assist this industry to develop and diversify.

There is also a need to extend the scope for preservation of local specialty foods, in a way which will retain their subtle characteristics, for export to wider markets in Asia and further afield. New products using local features could also be developed for export.

As the food industry develops alongside other industrial enterprises in Singapore the need for it to engage in cooperative ventures - research, development, waste-disposal, hygiene, standards and so on - will increase. The Food Development Centre is intended to be a focal point for all these controlled changes, and to become internationally eminent in these fields, in the Region.

Job Description: Food Conversion Expert

Duration: Three years

Date required: January 1972 DRAFT

Duty Station: Singapore

The Project

In order to promote the development of the Singapore Food Industry the Singapore Government, with UNIDO support, is establishing a Food Development Centre which will incorporate the work and some of the facilities of the existing Food Laboratory of the Singapore Institute of Standards and Industrial Research (SISIR). The support and participation of the Food industry is assured and the programme of the Centre will be to develop products and processes of particular relevance to the existing and future activities of the local food industry. Particular emphasis will be placed on conversion processes for foodstuffs (see explanatory note below*), on specialty preserved food products for export and on consultancy and other direct services to the local food industry. It is hoped that the work of the Centre will be such as to gain for it international eminence in due course.

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Duties

The food conversion expert will be responsible, under the project leader, for advising the Director and staff of the F.D.C. on all aspects of food conversion operations, including both product and process development, and may be requested to assist with the consultancy service provided by the Centre to Industry in this area of food processing.

Qualifications and Experience

A good Honours degree in an appropriate subject with substantial experience in one or more branches of the food conversion industry. Evidence of professional competence and attainment will be sought but breadth of experience and responsibilities in industrial development within this or associated fields is preferred to eminent specialisation in a limited area.

The appointee will work closely with counterpart staff in the F.D.C. and with other members of the UNIDO project team. Ability to work through others and to get on well with people is necessary.

Language

English

Background Information

Singapore is developing rapidly as an industrial centre but its food supplies are still mainly fresh, and of high quality. There is little case at present for their replacement by locally-preserved foods.

There is however a growing food conversion industry using imported raw materials from the region and one aim of this project is to assist this industry to develop and diversify.

There is also a need to extend the scope for preservation of local specialty foods, in a way which will retain their subtle characteristics, for export to wider markets in Asia and further afield. New products using local features could also be developed for export.

As the food industry develops alongside other industrial enterprises in Singapore the need for it to engage in cooperative ventures - research, development, waste-disposal, hygiene, standards and so on - will increase. The Food Development Centre is intended to be a focal point for all these controlled changes, and to become internationally eminent in these fields, in the Region.

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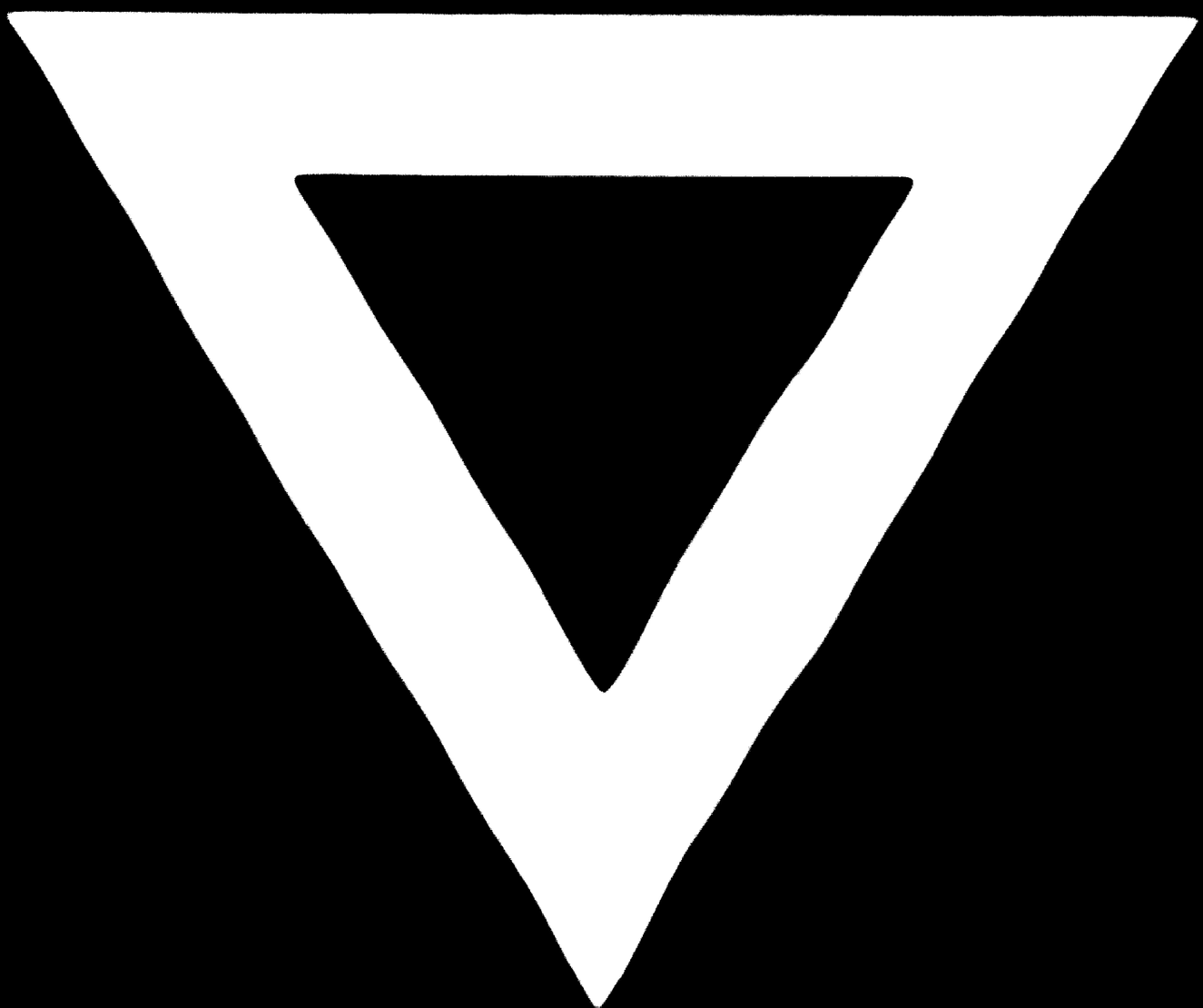

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