

REPORT
OF THE
COMMITTEE FOR MANUFACTURE
OF POULTRY EQUIPMENT
IN INDIA



MINISTRY OF STEEL, MINES & HEAVY ENGINEERING
(DEPARTMENT OF HEAVY ENGINEERING)
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CHAPTER I

INTRODUCTION

1.1. Poultry and eggs have come to be regarded all over the world as a rich source of animal protein of high biological value. Their importance as a complete and wholesome food has been emphasised alike by experts on human nutrition and authorities on food production. These articles of food have, therefore, been given an assured place in the balanced diet of the people.

1.2. The development of poultry is of special significance to India in the context of her perennial food shortage and the highly unbalanced diet of her people. Increased production of other protein food like milk and meat, which can be brought only through the development of breeds of cattle for milch purposes or of meat animals, is necessarily a long-term process, and cannot be expected to keep pace with the increasing demand from the fast growing population. Granted certain minimum facilities, a chicken weighing 3 lbs. and above can, on the other hand, be raised only in 10 to 12 weeks' time. Similarly, if artificial methods of incubation are adopted, poultry can be produced and multiplied in millions in a surprisingly short time and at less cost compared to that of production of meat, milk etc. Poultry farming has the additional advantage that it can provide gainful occupation to a sizeable section of the population in India including backward classes which are mostly engaged on this trade. Lastly, as a result of urbanisation, rise in economic level and better appreciation of the dietary value of eggs and poultry meat, sentiments and prejudices against the consumption of eggs and poultry meat in a large section of the population are fast disappearing. Development of poultry is, therefore, one of the surest and quickest means of increasing the food production in the country and of adding nutritive value to our diet at the same time.

1.3. According to the nutritional standards recommended by the Nutritional Advisory Committee and the Joint Committee of the Indian Council of Medical Research and Indian Council of Agricultural Research, the balanced diet to be aimed at in the country should have one egg per day per head. Taking the future human population at the end of the Sixth Five Year Plan to be 600 millions, the total requirement of eggs for 50% of the human population as potential consumers works out to one lakh million eggs per annum. The total estimated production of eggs in India in 1951 stood at 1,431 millions only. The first attempt to bridge this enormous gap between demand and supply, was made under the First Five Year Plan when a pilot project or poultry development was taken up on a country-wide basis. This scheme was further intensified under the Second Five Year Plan in which a provision of Rs. 258.25 lakhs was made for the establishment of five Regional Poultry Farms and 300 poultry development-cum-extension centres. The scheme achieved a large measure of success by the end of the Second Five Year Plan. The various schemes sponsored by the State Governments and Union Territories for the development of poultry also made fairly satisfactory progress. Partly because of this and partly due to the normal increase in the poultry population (which is now estimated at 117 millions against 94 millions in 1956 and 73 millions

in 1951), the total annual production of eggs in the country is now estimated at 2,880 millions against the target of one lakh million eggs mentioned earlier. The gap between demand and supply thus still continues to be enormous, the per capita consumption of eggs and poultry meat being only 7 eggs and 0.29 lbs. respectively in a year. To reduce the gap still further, various schemes for development and marketing of poultry which are estimated to cost Rs. 480 lakhs have been included in the Third Five Year Plan. It is expected that with the implementation of the Third Five Year Plan schemes, the total production of eggs in the country will increase to 6,000 millions in a year as against 2,880 millions as at the end of the Second Plan. In order, however, to achieve the target which is one egg per head per day to 50% of the human population, it will be necessary to increase the number of laying hens in the country by 20 times from 45 millions as at present to 900 millions. It will also be necessary to increase the productive capacity from 53 eggs per hen per annum as at present to at least 100 eggs per hen per annum. The latter objective can be achieved through the improvement in the quality of breeding stock, adoption of better feeding practices and introduction of modern management practices.

1.4. In most of the advanced countries, poultry farming has been completely revolutionised with the invention of incubators and the adoption of artificial methods of raising chicken so much so that 95-98 per cent poultry is produced there with the aid of incubators and reared artificially, against 2-3% in this country at present. It is no longer dependent upon the vagaries of nature and the slow, economically inefficient natural process and traditional methods. Poultry can now be produced and multiplied to order with the aid of modern incubators and brooding and rearing equipment. In view of the non-availability of mammoth incubators suitable for large-scale multiplication of poultry within the country, India has been depending largely on imports from foreign countries. This has been the greatest single limiting factor in the large-scale development of poultry in India. On the one hand, the various schemes for poultry development being implemented in the country have been largely handicapped due to inadequate incubation capacity. On the other hand, regular import of incubators and other poultry equipment is a continuous drain on the foreign exchange resources of the country. The question of developing the indigenous manufacture of such equipment had, therefore, been engaging the attention of the Ministry of Commerce and Industry and the Ministry of Food and Agriculture for some time past. The need for indigenous manufacture of poultry equipment as an essential pre-requisite to the development of the poultry industry in the country was specifically brought to the notice of the then Minister of Industry, Shri Manubhai Shah, at the time of sanctioning a programme for collaboration with a foreign firm for the development of this industry in the country, in December 1961. It was at his instance that the Government of India in the Ministry of Commerce and Industry appointed a Committee to formulate a programme of manufacture of poultry equipment in the country *vide* their Office Memorandum No. ME.Ind.3(1)/62, dated the 5th January 1962. The Committee consisted of the following :—

1. Shri Krishan Chand,
Joint Secretary,
Ministry of Food & Agriculture
(Deptt. of Agriculture), New Delhi.

Chairman

2. Shri S. K. Sinha,
Development Officer,
Development Wing,
Ministry of Commerce & Industry,
New Delhi.

Member

3. Shri A. Venkatesiah,
Development Officer,
Development Wing,
Ministry of Commerce & Industry,
New Delhi.

Member

4. Dr. Tula Ram,
Poultry Development Officer,
Ministry of Food & Agriculture
(Deptt. of Agriculture),
New Delhi.

*Member-
Secretary*

1.5. The terms of reference of this Committee were (i) to review the progress so far made in the manufacture of poultry equipment, and (ii) to make recommendations to Government on the programme of manufacture to be undertaken in the existing engineering units and in new units so as to make the country self-sufficient in this line in the next two years or so.



CHAPTER II

PROGRAMME OF WORK OF THE COMMITTEE

2.1. The Committee held four meetings in New Delhi under the Chairmanship of Shri Krishan Chand, Joint Secretary, Department of Agriculture. Shri T. N. Srivastava, Assistant Development Officer, Development Wing, attended the first meeting held on 30th March 1962, in place of Shri A. Venkatesiah. Dr. P. Bhattacharya, Livestock Development Adviser attended the meeting by special invitation. Other members of the Committee were also present. At this meeting, it was decided to (a) obtain information from the State Governments in the first instance about the prospective requirement of poultry equipment especially incubators during the next 15 years and (b) to send a questionnaire to the firms engaged on or interested in the manufacture of poultry equipment especially incubators. A draft circular letter (alongwith a list of poultry equipment commonly in use) proposed to be addressed to the various State Governments and Union Territories as also a draft questionnaire proposed to be issued to the firms interested in manufacture of poultry equipment were also approved at this meeting. Copies of (i) the circular to the State Governments alongwith the list of equipment and (ii) the circular to the manufacture of poultry equipment alongwith the questionnaire will be seen at Annexures I and II. Replies to the first circular were received from all State Governments/Union Territories except Assam. The second circular and the questionnaire were addressed to 40 firms out of whom 27 replied. A list of the firms who replied to the questionnaire is given at Annexure III.

2.2. The second meeting of the Committee was held on 19th June 1962. Sarvashri A. B. Mallik and P. S. Bhatnagar representing the Development Wing attended the meeting. Dr. P. Bhattacharya also attended the same by special invitation. A summary note prepared on the basis of replies received from the various State Governments etc. and from the private firms was reviewed at this meeting. It was agreed that poultry equipment of standard and uniform quality should be manufactured in the country and that emphasis should be laid on the early preparation of standard specifications for the same. The Committee also decided to visit some of the more important factories and engineering units at some important places with a view to finding out their present rate of production, the facilities at present available with them and the scope of development of their manufacturing capacity.

2.3. The third meeting of the Committee was held on 21st August 1962. At this meeting, the Development Wing was represented by Sarvashri P. S. Bhatnagar and A. B. Mallik. Shri S. B. Saran, representative of the Arbor Acres Poultry Breeding Farm Pvt. Ltd. was invited to give evidence at this meeting. It was generally agreed that it would be desirable to encourage one or two foreign collaboration programmes for the manufacture of specialised and high quality poultry equipment.

2.4. The fourth and the last meeting was held on 10th October 1962 to approve and sign the draft report of the Committee. The draft was approved subject to minor modifications. Besides the Chairman and the Members,

Shri A. B. Mallik attended this meeting as representatives of the Development Wing.

2.5. The Committee visited the manufacturing units of one firm in Gurdaspur, one in Delhi, seven in Calcutta, three in Bombay and three in Bangalore. The Committee also visited the Government Poultry Farm, Gurdaspur, Gurdaspur Poultry Cooperative, Regional Poultry Farm, Delhi Cantt., Delhi Poultry Breeder's Cooperative, India Veterinary Research Institute, Izatnagar and Mukteswar, Government Poultry Farms at Haringhata and Tollygunge (Calcutta), Regional Poultry Farms at Bombay and Bangalore and State Poultry Farm, Bangalore with a view to assess the types of poultry equipment needed in the country.

Acknowledgement

The Committee was set up by Shri Manubhai Shah, the then Minister of Industry, who appreciated the importance of poultry development as an industry in improving the standard of nutrition of the nation.

We wish to acknowledge the valuable assistance which the Committee has received from Dr. P. Bhattacharya, Livestock Development Adviser, Ministry of Food and Agriculture. He has been associated with the deliberations of the Committee throughout.

Our thanks are also due to Shri K. C. Sarkar, Under Secretary, Ministry of Food & Agriculture, who took great pains in helping the Committee in drafting the Report. Our thanks are also due to the Departments of Animal Husbandry of the various States who gave all possible help to the Committee during its visits to the States. The data supplied by the Departments as well as their contribution to the discussions have been of the greatest value to the Committee. The Committee would also like to express its thanks to the manufacturers of poultry equipment in different places, who answered the enquiries of the Committee in a comprehensive manner. Shri H. N. Kandhari, P. A. to the Chairman, took great pains in arranging for the programme of the Committee and also doing most of the typing work besides assisting in the collection of data.

CHAPTER III

TYPES OF EQUIPMENT IN USE IN THE POULTRY INDUSTRY, THEIR PRESENT AVAILABILITY AND FUTURE DEMAND IN INDIA

3.1. In the first Chapter, a passing mention has been made about the important role played by poultry equipment in any programme for poultry development. Incubators, closely followed by brooding equipment, are the essential pre-requisites for launching any comprehensive scheme for development and multiplication of poultry. Replies received from the State Governments/Union Territories in response to the circular addressed by the Ministry of Food and Agriculture reveal that there is almost unlimited scope for development of the poultry equipment manufacturing industry in the country. It will be important to mention in this connection that according to the present policy of the Government, poultry farming is no longer treated as a venture in the agricultural sector alone. It is now steadily assuming an industrial character. The Ministry of Commerce and Industry have recently sanctioned two schemes for establishment of three large poultry breeding farms in the private sector with foreign collaboration. These farms are expected to produce about three million breeding birds every year. The multiplication of these birds will in its turn, lead to the establishment of commercial hatcheries and supporting farms at the farmers' level and also the establishment of a broiler industry. These industrial developments are bound to bring about a further increase in the existing demands for poultry equipment in the country. The following paragraphs give an account of (i) the various types of equipment ordinarily used in the poultry industry, (ii) their present availability and (iii) future demands for the same as intimated by the State Governments/Union Territories.

Incubators

3.2. It is only through the use of incubators that more than 50,000 day old chicks can be produced from 1,000 laying hens in a year. The efficiency of incubators, however, depends largely on their capacity. Larger the capacity, the more efficient is the production. Small incubators with a capacity ranging from 50 to 300 eggs have been found to be very uneconomical and have no place in the future shape of things to come. The minimum capacity of incubators intended for use by private farmers should be 1,000 eggs which will take care of the egg production of 100 laying hens per month. Larger poultry establishments, poultry farms etc., require only large incubators with a capacity ranging from 1,500 to 5,000 eggs.

3.3. At present the total incubation capacity available in the country is sufficient for about 0.5 million eggs only. This accounts for hardly 2 per cent of the total poultry production in the country. As stated earlier, it will be necessary to increase the poultry population in the country from 45 million as at present to 900 million in the next 15 years or so. This means that the existing incubation capacity will also have to be increased to about 400 million eggs.

3.4. The present availability is hardly suitable or adequate to meet this demand. Twenty-four out of 27 engineering firms who responded to the

questionnaire issued by the Committee have reported that they are engaged in manufacture of incubators. Of these, 8 are reported to be manufacturing incubators with a capacity ranging from 50 to 4,000 eggs. The Committee however, observed that only three firms at Delhi, Bangalore and Gurdaspur are actually engaged in manufacture of incubators with a capacity of 1,500 eggs or more, while nine firms are manufacturing incubators of 50 to 250 egg capacity only. Actual trials carried out at the Government poultry farms have shown satisfactory hatching results in respect of the large incubators being manufactured by the two firms. These three firms among themselves produced and sold 41 incubators of 1,500 egg capacity and above during one year. One firm in Madras produced and sold 94 incubators of 600 egg capacity each. These and other firms have also been manufacturing similar incubators of sizes varying from 50-400 egg capacity. The total annual production at all these 13 firms is of the order of 1,108 incubators with a total incubation capacity of over one lakh eggs.

3.5. According to the estimates furnished by the various State Governments/Union Territories, 30,000 incubators of 1,500 to 5,000 egg capacity valued at about Rs. 10 crores will be required during the next 15 years. The Committee considers this estimate to be on the low side partly because some of the State Governments do not appear to have taken into consideration future demands for incubators in the private sector and partly because of the fact that this estimate falls far short of the target of producing 95 per cent poultry in incubators, as in all advanced countries. In order to maintain 900 million layers from year to year, which is the target, it will be necessary to put into commission more than one lakh incubators with a total capacity of 400 million eggs. Keeping in view the existing conditions prevailing in the country, 60,000 incubators of 1,500-5,000 egg capacity valued at about Rs. 20 crores may be adopted on a modest scale as the estimated requirement of the country for the next 15 years. This shows that there is a vast scope for developing the manufacture of incubators in the country.

Brooding and Rearing Equipment

3.6. Brooding and Rearing Equipment consist of battery brooders and floor brooders which can be worked on electricity, coal, kerosene oil or gas. All brooders need thermostatic control for maintaining the temperature at the required level. Next to incubators, this equipment is essentially needed for mass raising of chickens by artificial means.

3.7. It is not difficult to manufacture this equipment in the country. In fact, it is already being manufactured at present by 9 firms who are reported to have produced 11 battery brooders and 793 electric and kerosene oil brooders in one year. It is expected that the existing manufacturing units would be able to meet the entire requirements of the country, if they are properly organised. For this purpose, it will be necessary, in the first instance, to prescribe the specifications for manufacture of brooders of standard and uniform quality.

3.8. On the basis of the replies received from the State Governments etc., the estimated requirement of battery brooders and floor brooders for the next 15 years has been placed at one lakh units with a capacity of 100-300 chicks per unit. This is very much on the low side keeping in view the level of production proposed to be achieved. Even on a modest

estimate, the requirement for this equipment should not be anything less than 10 lakh units valued at about Rs. 10 crores during the next 15 years.

Minor Farm Equipment

3.9. This includes different types and sizes of feeding and watering equipment, laying nests and trap nests, poultry crates, wire baskets for collecting eggs, catching and handling rods, galvanised wire netting (chick wire) etc. which are put to daily use for running a poultry farm—big or small. All this equipment is already being manufactured in the country and there should be no difficulty in increasing the production to meet increased demands. As in the case of brooding and rearing equipment, it will, however, be necessary to lay down specifications for the different types and sizes of the equipment and also for the type of material to be used in their manufacture. Demands for this equipment will be almost unlimited particularly when poultry farming is commercialised in the country.

3.10. The other farm equipment which needs special attention are electric de-beakers and foggers. The de-beakers are used for removing the beak of the chickens at the growing stage so as to prevent the aggressive birds from picking the feathers of other birds and bullying them. This is particularly useful in commercial units raising hundreds and thousands of chickens under intensive methods. The foggers are used for producing a mist for bringing down temperature in the chicken houses during summer months. This will also be in great demand by commercial broiler raisers and commercial egg producers. These two items are not being manufactured in the country at present. It is, however, expected that the manufacturing units will be in a position to undertake the production of these two items if samples of the same are shown to them.

Chick Baskets

3.11. With the setting up of commercial hatcheries on a large scale throughout the country, the problem of transporting baby chicks from the hatcheries to different parts of the country by rail, road and air will gain further importance. Any containers used for the purpose must be light and ventilated and they must at the same time be able to withstand long journeys and rough handling. Card board chick baskets are ordinarily used throughout the world for this purpose. There will be no difficulty in the manufacture of these boxes within the country itself. It will, however, be necessary to import a few samples of different shapes and sizes and to make the same available to a few selected firms for fabrication purposes. The demand for this type of boxes will be in thousands in the initial stages and will be further increased to lakhs as the proposed commercial hatcheries come into existence.

Breeding Equipment

3.12. The equipment required for breeding programmes consists of pedigree cages, wing bands and leg bands. There is no difficulty about the manufacture of pedigree cages and leg bands. Some firms in India are already manufacturing wing bands and leg bands but the quality of the same needs improvement. For the manufacture of special quality wing bands, it will, however, be necessary to show a few imported samples to the engineering firms so as to enable them to undertake the manufacture

of the same. The demand for all this equipment which is confined to breeding farms only, is expected to be in thousands and lakhs.

Equipment for Storage and Marketing of Eggs

3.13. Eggs are usually transported in fragile baskets with no satisfactory packing material inside, with the result that there is usually a breakage of 5–10 per cent in transit. Absence of grading of eggs for *quality* and size also renders 10–20 per cent eggs unfit for human consumption. Storage arrangements for eggs in the country are both meagre and unsatisfactory and this results in loss of about 10–20 per cent eggs during summer. When proper arrangements for marketing of eggs are adopted in the country, it will be necessary to obtain the following equipment in sufficient quantities :

- (a) electric and hand worked graders,
- (b) candling lamps,
- (c) fillers and flats,
- (d) electrical and mechanical egg washers,
- (e) card board egg cartons
- (f) wooden or card board egg cases,
- (g) egg room coolers,
- (h) egg oiling machines.

3.14. One firm in Punjab has manufactured and sold eight egg room coolers. One firm in Bangalore has also manufactured one egg washer. These, however, have not been seen in actual use. The Committee considers that of the equipment mentioned above, electric graders, electric and mechanical egg washers, egg cartons and egg oiling machine deserve special attention. As for fillers and flats, it will be difficult to manufacture the same in India without foreign technical know-how or collaboration. A few samples of this equipment may perhaps be imported for local fabrication. According to the future demands indicated by the State Governments, about 1,150 egg room coolers, 1,300 automatic electric graders, 3,000 hand graders, two million fillers and flats and unlimited number of candling lamps, egg cartons, wooden or card board egg cases will be needed during the next 15 years.

Equipment for Storage and Marketing of Poultry Meat

3.15. Live birds are now being marketed in the country for table purposes. The demand for dressed poultry meat is, however, steadily increasing in large cities where cold storage and refrigeration facilities are available. The need for storage of dressed meat will further increase with the coming up of the broiler industry. If the birds are dressed at the premises of the producing centres themselves, the transport of the same to consuming centres is expected to be much more economical.

3.16. According to the demands intimated by the State Governments etc., 300 poultry dressing plants with a capacity of 400–2,000 birds per day and 600 deep freeze cabinets will be required during the next 15 years. It will also be necessary to import a few large processing plants with a capacity of 500 birds per hour to meet the minimum requirements of large cities like Delhi, Calcutta and Bombay. At present only one firm has been able to fabricate the poultry picker *viz.*, rubber picking fingers, will, however, have to be imported for fabrication purposes. The larger dressing plants may be fabricated in the country at a later stage.

Feed Manufacturing Equipment

3.17. Development of commercial poultry industry in the country is dependent upon the availability of ready made poultry feeds. For the preparation of balanced poultry feed, it is necessary to set up feed mixing plants on a large scale in the country. The equipment necessary for this are feed mixers and feed grinders.

3.18. Two firms have already manufactured feed mixers and feed grinders and have sold three mixers and two hammer mills (grinders) during the course of one year. According to the demands of the State Governments, 600 units of feed mixers and grinders will be required during the next 15 years.



CHAPTER IV

PROBLEMS OF MANUFACTURING FIRMS AND MEASURES TO SOLVE THEM

4.1. In the questionnaire, interested manufacturing concerns were requested to indicate the nature and extent of assistance required from Government or from other sources for increasing their production and to offer their own views about the steps to be taken to place the poultry equipment manufacturing industry in India on sound footing. They were also asked to indicate difficulties, if any, experienced in the matter of manufacturing products according to specifications, marketing of their products and developing the trade in general. It has been stated earlier that only 27 out of 40 firms addressed in the matter replied to the questionnaire. Nevertheless, on an analysis of the data actually received, the Committee is of the opinion that the views expressed by these 27 firms should be accepted as fairly representative. In the following paragraphs, the various suggestions made by the firms have been examined and suitable recommendations made.

Existing demands for poultry equipment

4.2. The replies from the firms reveal that Government Departments account for about 90% of the total demands placed on the manufacturing firms, the remaining 10% being received from private parties. Most of the firms replying to the questionnaire have, however, complained of lack of steady and uniform demand for incubators and other poultry equipment. Another complaint is that orders for the equipment are mostly received during the period from December to March and that they are not spread over the whole year. Suggestions have accordingly been made that positive demands for poultry equipment should be created and steps taken to ensure that only firm demands are placed on the manufacturing concerns, as such orders would provide a direct incentive to the firms for increasing their production. One firm has suggested that Government should give an undertaking to purchase a minimum number of incubators and other items of poultry equipment produced by the firm in the first 10 years or so. Another suggestion is that Government should place an order with the firm for one or two large sized incubators of 1,500 to 2,000 egg capacity on a firm *non-rejectable* basis.

4.3. The Committee has carefully considered all these suggestions. Demands for poultry equipment will largely depend on the type and quality of equipment produced by the firms. This in turn is linked up with the question of laying down standards and specifications for various items of equipment. Suitable recommendations in this regard have been made elsewhere in this Chapter. With the development of the industry, there will be larger reliance on indigenous manufacturers. The commercialisation of poultry farming in India is expected to give a further incentive to the indigenous industry. Demands for the equipment can be more steady and uniform. For the present it will suffice if a recommendation is made to the State Government and other buying Departments to give preference to

indigenous poultry equipment to meet their own requirements. The desirability of spreading out the indents over the whole year may also be brought to the notice of the State Governments, Union Territories and others concerned.

4.4. The Committee has no objection to the suggestion that Government Departments should, as far as possible, place firm orders for supply of incubators and other equipment with the manufacturing concerns. They, however, consider that orders for incubators should, in the initial stages, be placed in respect of those with a maximum capacity of 3,000 eggs only. However, in respect of higher capacity incubators, orders can also be placed on indigenous manufacturers provided they are prepared to accept a penalty clause for satisfactory performance. It is obviously not desirable to place any orders for incubators on non-rejectable basis as suggested by one firm.

4.5. Most of the firms have complained of delays in Government Departments in making payments. It has been pointed out that this results in the blocking of the firm's capital. One firm has suggested in this connection that purchases of poultry equipment by Government Departments be made on the lines followed by the Defence Departments where goods are taken delivery of by their inspectors and inspection notes are issued immediately. Such inspection notes can be cashed immediately on 60-80 per cent of the value of the goods. This practice greatly facilitates the running of industrial units. Although delays in making payments are not confined to poultry equipment alone, the Committee recommends that, as a measure of promoting the infant industry, a recommendation could be made to buying Government Departments to reduce the time lag between delivery and payment to the barest minimum.

Technical know-how

4.6. The majority of the firms who replied to the questionnaire reported that they possessed necessary facilities for obtaining expert technical opinion on the manufacture of incubators and other poultry equipment. This was, however, not borne out in all cases by the actual experience of the Committee which visited the premises of some of the firms. It is true that there was general keenness and interest in many of the firms for the manufacture of poultry equipment. It was, however, observed that the limiting factor was the absence or inadequacy of technical know-how particularly with regard to the manufacture of large-sized incubators of standard quality and specifications. The types of equipment for the manufacture of which expert technical knowledge is essential are (a) large sized incubators with automatic temperature and humidity control system and automatic turning devices, (b) floor and battery brooders, (c) automatic feeding and watering equipment, (d) electric debeakers, (e) poultry weighing scales, (f) foggers, (g) electric graders, (h) electric egg washers, (i) egg cartons, (j) fillers and flats, (k) egg room coolers, (l) poultry processing equipment including electric feather pickers, rubber picking fingers, electric scalders, (m) deep freeze cabinets, (n) feed mixers, (o) feed grinders etc. The objective in this regard can be largely achieved if the following steps are taken :—

(i) Some of the firms suggested that in order to fabricate and adopt the various types of specialised equipment, they should be permitted to import incubators and other specialised types of equipment of

standard designs like automatic feeders, poultry dressing plants, egg grading machines etc. from Japan and U.S.A. The Committee considers that this is a very reasonable suggestion and recommends that a few selected firms in the line should be permitted to import samples of such equipment purely for fabrication purposes. A list of equipment of which specimens will be needed for fabrication purposes is given in Annexure IV.

(ii) Fifty per cent of the firms replying to the questionnaire indicated that they would not like to avail of any foreign collaboration in the line as they felt that they could themselves manufacture incubators and other poultry equipment without foreign assistance. Six firms, however, were inclined to go in for foreign collaboration and some of them are actually exploring the possibility of collaboration of some recognised foreign firms. One of these firms is reported to have already finalised the terms of collaboration with a foreign firm of good standing. In spite of the absence of any large scale demands in this direction, the Committee feels that there is a clear need for bringing in one or two foreign collaboration programmes for the manufacture of mammoth incubators above 5,000 egg capacity with automatic control system, poultry processing equipment, poultry feed manufacturing equipment, fillers and flats, automatic feeding and watering equipment etc. Besides providing the technical know-how, such programmes will also help to give practical training to Indian personnel.

(iii) A suggestion has been made that facilities for travel abroad should be provided by Government to the firms for studying the manufacture of poultry equipment, especially incubators. The Committee feels that it will not be necessary to make a general recommendation on this suggestion and that each case could be examined on its merits. The Committee recommends that it will be more desirable to arrange for the assignment of a Poultry Equipment Production Engineer under any of the Foreign Aid Programmes. He should be an Electrical and Mechanical Engineer and should be able to advise the firms on the manufacture of incubators and various types of brooders (gas, electric or kerosene oil) with automatic control systems, feed mixers, grinders and electric graders.

Regulation of Imports

4.7. Three firms manufacturing large incubators said in reply to the questionnaire that they had been using indigenous components in manufacture of the machines. On actual visit to the premises of the firms, the position was found to be otherwise. The Committee observed that some of the components being used by them were imported ones which were being obtained from the local market at very much higher prices. One firm said that they would need imported components of the value of 15-20 per cent of each incubators during the first three years after which they would completely replace the same with indigenous parts in the course of three years or so. Considering the replies received from the various firms, the Committee considers that in the initial stage which may extend to five years, the Indian manufacturers will need to import components ranging from 10-30 per cent. A list of the essential components which are mostly used in the manufacture of incubators and other equipment and which are not being produced in the country at present has been given at Annexure V.

4.8. Opinion of the firms on the question as to whether they would be in a position to meet the entire demands for poultry equipment from Government and private sources was largely divided. The majority of them has, however, reported that they will be in a position to meet the entire demands with their existing resources. Some of the firms have suggested that they would be able to meet full demands with certain assistance from Government such as financial assistance, facilities by way of import of essential components and phasing of the demands throughout the year. The Committee agrees that most of the firms would be able to meet the entire demands for certain types of equipment viz. floor brooders, feeding and watering equipment, nests, crates, candling lamps etc. according to standard and specifications. The manufacture of equipment listed in Annexure VI will, however, not be possible without import of essential components, greater technical knowledge, foreign collaboration and general expansion of the manufacturing units. The Committee recommends that the import of the types of equipment listed in Annexure VII should be dispensed with.

4.9. A few firms have suggested that the import of incubators should be banned to encourage local manufacturers. The Committee does not agree with the suggestion. So long as incubators of 5,000 egg capacity and above with precision, temperature and humidity and automatic turning devices are not manufactured in the country, it would neither be possible nor desirable to place a total embargo on import of incubators without serious detriment to the poultry development work in the country. The Committee, therefore, is of the opinion that import of incubators of 5,000 egg capacity and above need not be controlled. The import of smaller incubators may be banned.

4.10. It will be observed from the foregoing paragraph that the need for importing incubators of 5,000 egg capacity and above will continue for some time to come. The need for importing specimens of individual items of other poultry equipment for fabrication purposes will also continue till the Indian industry is fully organised. The extent of foreign exchange required for such imports will vary from time to time depending upon the firm requirements both of the State Governments, Union Territories and of the manufacturing firms. The Ministry of Food and Agriculture (Department of Agriculture) will be in the best position to collect and co-ordinate the demands both from the State Governments, Union Territories etc. and from the manufacturing firms. They will also be in the best position to assess the reasonableness or otherwise of the demands of individual applicants. The Committee, therefore, recommends that suitable provision for foreign exchange should be made in the foreign exchange quota of that Department so as to obviate the need for obtaining clearance from the Department of Economic Affairs in each individual case.

Standardisation

4.11. More than half the firms replying to the questionnaire have stated that they do not feel any need for Government control and supervision on their manufacturing programme. A few firms have, however, shown their willingness for such control and supervision, mainly with a view to obtaining technical guidance and supervision over the quality of the products. The Committee considers that while there is no need for Government control and supervision over the technical programme of the manufacturing firms,

there is certainly a need for checking the quality of the material used according to standards and specifications.

4.12. It has been suggested that the standardisation of poultry equipment and laying down specifications for the same should be undertaken at Government level so as to ensure that equipment of standard and uniform quality is produced in the country. This suggestion is strongly supported by the Committee. It is recommended that the Ministry of Food and Agriculture may consider the desirability of setting up of a Committee in collaboration with the Indian Standards Institution for this purpose.

4.13. Excepting 6 firms, all others have reported that the incubators being manufactured by them are being tested before sale. These tests are, however, confined to the checking of the temperature and humidity range for short duration at the firms' premises. Only in two cases, the incubators manufactured by the firms were tested at the State Poultry Farms for complete trial runs. A copy of the test report will be seen at Annexure VII.

4.14. The Committee considers that these tests are not adequate. A few incubators manufactured by each firm should be tested firstly for the quality of the materials and different parts used. Subsequently actual trial for two consecutive hatches should be run for comparison with incubators of foreign make under similar conditions. The Committee recommends that the Ministry of Food and Agriculture should arrange to provide facilities for such testing at the Regional Poultry Farms and at the State Poultry Farms. The inspection and testing of the material used in the manufacture of the equipment may, on the other hand, be carried out by the Industries Departments in the States in collaboration with the State Poultry Development Officers.

4.15. One of the firms has suggested that Government should promptly point out any defects in the poultry equipment purchased from them so as enable them to set the defects right. This suggestion will be taken care of as and when a poultry equipment manufacturing technician is assigned to the Government of India. His services will be available to the firms.

4.16. It has been suggested that Government should exercise supervision as to whether the specifications laid down for the poultry equipment are actually observed by the indigenous manufacturers. The Committee does not consider such a supervision to be necessary as it is expected that in order to build up their reputation, the firms themselves will use the material etc. of standard specifications. Besides, the inspection and testing of the equipment provided for in para 4.14 above will automatically take care of this suggestion.

4.17. It has been suggested that poultry equipment should be treated on par with agricultural implements and that all facilities provided to the fabricators of agricultural implements by way of priority allotment and movement of raw materials etc. should be extended to manufacturers of the poultry equipment mentioned above as well. The Committee supports the suggestion.

4.18. For the manufacture of poultry equipment in general and the fabrication of its components which have been recommended for import, it will be essential to arrange for the release of raw materials like iron and steel, G.I. sheets and wires, aluminium sheets, asbestos sheets, steel, zinc sheets, black sheets, etc. at controlled rates to the manufacturers.

Assistance to Manufacturers

4.19. Most of the firms have asked for financial assistance in the form of loans for expanding their business. This request is considered to be very reasonable particularly at the initial stages of development of the industry. The Committee, therefore, recommends that all requests for loan assistance from the poultry equipment manufacturers should be sympathetically considered by the State Industries Department and the Industrial Finance Corporation. If necessary, Ministry of Food and Agriculture should also consider to provide loans for this purpose.

4.20. Most of the firms have also asked for facilities by way of land, work-sheds, supply of electricity etc. These are normal and essential requirements of any industry. Requests for the same should, therefore, be considered sympathetically by the authorities concerned. The Committee also recommends that the firms interested in the manufacture of poultry equipment especially incubators should be encouraged to register with the Directors of Industries in the States for the purposes of obtaining facilities normally available to small-scale industries viz. (a) technical assistance from the Small Industries Services Institute (b) land and electric power (c) supply of machinery under hire-purchase system (d) allotment of factory sheds in the Industrial estates (e) financial assistance (f) assistance for supply of raw material at controlled rates (g) essentiality certificate for import of raw material and components and (h) facilities for commercial and marketing services.

Miscellaneous suggestions for the development of the poultry equipment industry in the country.

4.21. A few firms have suggested that poultry farming should be intensified on modern lines by setting up poultry farms in each village and that interest in poultry farming should be created through propaganda and distribution of leaflets describing the economics of poultry keeping, the technical know-how required for successful poultry farming etc. It has been pointed out that the proposed intensification of poultry development will automatically help to create demands for poultry equipment. The suggestion has already been accepted in principle by the Central and State Governments who have sponsored various schemes under the Five-Year Plans for development of poultry not only in and around big cities but also in remote village areas. Under some of these schemes, interested farmers are being given free training in poultry farming. The schemes also provide for making available to them breeding stock, brooding and rearing equipment and incubators at subsidised rates. Subsidy is also admissible to them for improving their poultry houses. Supply of hatching eggs and breeding birds can be made available to interested farmers from about 300 poultry development-cum-extension blocks which have been set up all over the country under the Second Five Year Plan. The Committee considers that inspite of this progress, there is still considerable scope for intensifying the poultry development programme further. They, therefore, recommend that the need for development of poultry farming on modern lines in both rural and urban areas in an intensive and integrated manner, should again be impressed upon the State Government by the Ministry of Food and Agriculture. The latter should also arrange for the preparation of suitable leaflets describing the usefulness of various types of poultry

equipment both through the Directorate of Extension and Training and through the concerned departments in the States for free distribution.

4.22. It has been suggested that a conference of all manufacturers of poultry equipment should be held at the time of the All India Poultry Breeders Conference for discussing and formulating specifications which should be adhered to by all concerned. As specifications for poultry equipment are proposed to be formulated in consultation with the Indian Standards Institution, it should not be necessary for the manufacturers to discuss the same at annual gatherings. The Committee, however, recommends that for an exchange of ideas among themselves, the manufacturers of poultry equipment may also be invited to the annual conference of poultry breeders.



CHAPTER V

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

CHAPTER I.—*Introduction*

1.1. & 1.2. Poultry and eggs have been recognised all over the world as a complete and wholesome food. The development of poultry is of special significance to India as it is one of the surest and quickest means of increasing production of nutritious food. It is also a profitable commercial as well as cottage industry.

1.3. To provide egg to 50% of the human population as potential consumers as at the end of the Sixth Five Year Plan, the annual production will have to be increased from 2,880 millions as at present to one lakh millions.

1.4. & 1.5. This objective can be largely achieved through the use of incubators in larger numbers and the adoption of artificial methods of raising chickens. Dependence on import of incubators and other poultry equipment is, however, a continuous drain on the foreign exchange resources of the country. A Committee, was, therefore, constituted by the Ministry of Commerce and Industry on 5th January, 1962, to formulate a programme of manufacture of poultry equipment in the country. The terms of reference of the Committee were (i) to review the progress so far made in the manufacture of poultry equipment and (ii) to make recommendations to Government on the programme of manufacture to be undertaken in the existing engineering units and in new units so as to make the country self-sufficient in this line in the next two years or so.

CHAPTER II.—*Programme of work of the Committee*

2.1., 2.2., 2.3., 2.4. & 2.5. The Committee held four meetings in New Delhi, ascertained demands for poultry equipment from the State Governments and Union Territories and collected information from 27 out of 40 manufacturing firms addressed in the matter. It also visited the premises of the manufacturing units, the Regional and State Poultry Farms, etc.

CHAPTER III.—*Types of equipment in use in the poultry industry, their present availability and future demand in India.*

3.1. Incubators and brooding equipment are essentially needed for poultry development programmes. There is almost unlimited scope for the development of the poultry equipment manufacturing industry in the country.

Incubators

3.2. The minimum capacity of incubators intended for use by private farmers should be 1,000 eggs. Larger poultry establishments require only large incubators with a capacity ranging from 1,500 to 5,000 eggs.

3.3., 3.4. & 3.5. The present incubation capacity in the country is estimated at 0.5 million eggs. It will be necessary to increase this capacity to 400 million eggs in order to achieve the target of 900 million birds in

15 years. The present annual production is about 1,100 incubators, mostly of smaller sizes with a total capacity of over one lakh eggs. The estimated requirement of the country for the next 15 years is of the order of 60,000 incubators of 1,500 to 5,000 egg capacity.

Brooding and Rearing Equipment

3.6., 3.7. & 3.8. About 800 battery brooders and floor brooders are being manufactured annually. The requirement of this equipment for the next 15 years is estimated at 10 lakhs units. The existing units will be in a position to meet this demand provided specifications are laid down for the brooders.

Minor Farm Equipment

3.9. The production of feeding and watering equipment, laying nests, trap nests, poultry crates, wire baskets, catching and handling rods, wire-netting etc. can be increased to meet the increasing demands. It will, however, be necessary to lay down proper specifications for the various types of equipment.

3.10. Electrical de-beakers and foggers are not being produced in the country at present. Some of the manufacturing units will, however, be in a position to undertake the production of the same if samples are shown to them.

Chick Baskets

3.11. Card board baskets should be light, strong and ventilated. Some selected Indian manufacturers can make these baskets if samples of different shapes and sizes are made available to them for fabrication purposes.

Brooding Equipment

3.12. Pedigree cages, wing bands and leg bands can be produced in the country. For the manufacture of special quality wing bands, it will be necessary to show a few imported samples to the manufacturing firms.

Equipment for Storage and Marketing of Eggs

3.13. & 3.14. About 1,150 egg room coolers, 4,000 graders, 2 million fillers and flats and an unlimited number of candling lamps, egg cartons, egg cases etc. will be needed during the next 15 years. For manufacturing fillers and flats, it will be necessary either to obtain expert advice of a foreign technician or to import samples for local fabrication. The rest can be manufactured in the country.

Equipment for Storage and Marketing of Poultry Meat

3.15. & 3.16. About 300 poultry dressing plants with a capacity of 400 to 2,000 birds per day and 600 deep freeze cabinets will be required during the next 15 years. A few larger plants will be required for the big cities. The import of rubber picking fingers in poultry pickers will be necessary for fabrication purposes and for their manufacture in India.

Feed Manufacturing Equipment

3.17. & 3.18. About 600 units of feed mixtures and grinders will be required by the State Governments during the next 15 years. These are being manufactured in the country

CHAPTER IV.—*Problems of manufacturing firms and measures to solve them*

4.1. The suggestions made by the manufacturing firms and the Committee's recommendations on the same are given below :—

Existing demands for poultry equipment

4.2., 4.3., 4.4. & 4.5. The suggestions/complaints made by the firms are that (i) there is lack of steady and uniform demand from Government departments which account for about 90% of the demands, (ii) orders for the equipment are not spread over the whole year, (iii) only firm demands should be placed on them, (iv) Government should give an undertaking to purchase a minimum number in the next 10 years or so and (v) Government should place an order for one or two large incubators on a non-rejectable basis, (vi) Delays in payment by the buying Departments should be avoided.

Recommendations :

- (i) A recommendation may be made to the State Governments and other buying departments to give preference to indigenous equipment and to spread out the indents over the whole year.
- (ii) Government Departments should, as far as possible, place firm orders for incubators and other equipment. Orders for incubators should however, be confined in the initial stages to those with a maximum capacity of 3,000 eggs only.
- (iii) Incubators with automatic controls should be preferred.
- (iv) It is not desirable to place any orders for incubators on non-rejectable basis as suggested by one firm.
- (v) As a measure of promoting the infant industry, a recommendation may be made by the Ministry of Food and Agriculture to the buying Government Departments to reduce the time lag between delivery and payment to the barest minimum.

Technical Know-how

4.6. There is absence or inadequacy of technical know-how particularly with regard to manufacture of large sized incubators. There is a clear need for providing the same to the manufacturing firms.

Recommendations :

- (i) A few selected firms should be permitted to import samples of highly specialised equipment purely for fabrication purposes. A list of equipment of which specimens will be needed is given in Annexure IV.
- (ii) Government should sponsor one or two foreign collaboration programmes for the manufacture of mammoth incubators above 5,000 egg capacity with automatic control system, poultry processing equipment, poultry feed manufacturing equipment, fillers and flats, automatic feeding and watering equipment etc.

- (iii) It will be desirable to arrange for the assignment of a Poultry Equipment Production Engineer, under any of the foreign aid programmes.

Regulation of Imports

4.7. Some of the components used by the manufacturing firms in the manufacture of poultry equipment are imported ones which have been obtained from the local market at exorbitant rates.

Recommendation :

In the initial stages which may extend to five years, the Indian manufacturers may be allowed to import components ranging from 10 to 30 per cent. A list of the essential components has been given in Annexure V.

4.8. The manufacture of equipment listed in Annexure VI will, however, not be possible without import of essential components, greater technical know-how, foreign collaboration and general expansion of the manufacturing units.

Recommendations :

Import of certain types of equipment (listed in Annexure VII) should be dispensed with.

4.9. & 4.10. The Committee does not agree that the import of incubators should be banned altogether to encourage local manufacturers.

Recommendations :

- (i) Import of incubators of 5,000 egg capacity and above should not be controlled. The import of smaller incubators may, however, be banned.
- (ii) The Ministry of Food and Agriculture (Department of Agriculture) may collect and coordinate from time to time the demands of the State Governments/Union Territories etc. as also from the manufacturing firms in respect of foreign exchange requirements.
- (iii) Suitable provision for release of foreign exchange should be made in the foreign exchange quota of that Department so that they may themselves operate on the same.

Standardisation

4.11. to 4.18.

Recommendations :

- (i) There is no need for Government control and supervision over the technical programme of manufacturing firms. There is, however, a need for checking the quality of material used to ensure that it is according to standards and specifications.
- (ii) The Committee strongly supports the suggestion that standardisation of poultry equipment and laying down specifications for the same should be undertaken at Government level. The Ministry of Food and Agriculture may consider the desirability of setting

up a Committee in collaboration with the Indian Standards Institution for this purpose.

- (iii) A few incubators manufactured by each firm should be tested firstly for the quality of the materials and parts used. Subsequently they should be run for two consecutive hatches.
- (iv) The Ministry of Food and Agriculture should arrange to provide facilities for such trial tests at the Regional Poultry Farms and also at the State Poultry Farms.
- (v) The inspection and testing of the material used in the manufacture of the equipment may be carried out by the Industries Departments in the States in collaboration with the State Poultry Development Officers.
- (vi) All facilities provided to the fabricators of agricultural implements by way of priority allotment and movement of raw materials etc. should be extended to manufacturers of poultry equipment.
- (vii) For the manufacture of poultry equipment in general and the fabrication of its components in particular, raw materials like iron and steel, G.I. sheets and wires, aluminium sheets, asbestos sheets, sheet steel, zinc sheets, black sheets etc. should be released to the manufacturers at controlled rates.

Assistance to Manufacturers

4.19. & 4.20.

Recommendations :

- (i) All requests for loan assistance from poultry equipment manufacturers may be sympathetically considered by the State Industries Department and the Industrial Finance Corporation.
- (ii) The Ministry of Food and Agriculture may also consider providing loans for this purpose, if necessary.
- (iii) Requests for facilities by way of land, work sheds, supply of electricity etc. may be considered sympathetically by the authorities concerned.
- (iv) Firms interested in manufacture of poultry equipment especially incubators should be encouraged to register with the Directors of Industries in the States for the purposes of obtaining facilities normally available to small-scale industries viz. (a) technical assistance from the Small Industries Services Institute (b) land and electric power (c) supply of machinery under hire-purchase system (d) allotment of factory sheds in the industrial estates (e) financial assistance (f) assistance for supply of raw material at controlled rates (g) essentiality certificate for import of raw material and components and (h) facilities for commercial and marketing services.

4.21. & 4.22.—*Miscellaneous suggestions for the development of poultry equipment industry in the country.*

Recommendations :

- (i) The Ministry of Food and Agriculture may impress upon the State Governments the need for development of poultry farming on

modern lines in both rural and urban areas in an intensive and integrated manner. That Ministry may also arrange for the preparation of suitable leaflets describing the usefulness of various types of poultry equipment either through the Directorate of Extension and Training or through the concerned departments in the State for free distribution purposes.

- (ii) For an exchange of ideas among themselves, the manufacturers of poultry equipment may be invited to the annual conferences of poultry breeders which is held in conjunction with the all India Cattle and Poultry Shows.



ANNEXURE I

(Please see para 2.1 of the main report).

No. 18—16/61-LD

GOVERNMENT OF INDIA

MINISTRY OF FOOD & AGRICULTURE

(Deptt. of Agriculture)

New Delhi, the April, 1962

FROM

SHRI K.C. SARKAR, M. A.,

Under Secretary to the Govt. of India

To

All State Governments/Union Territories,

SUBJECT : *Manufacture of Poultry Farm Equipment*

SIR

The importance of poultry and eggs as a wholesome and complete food has been emphasised in recent years on various occasions by authorities on nutrition and food production all over the country, International Organisations etc. To develop this industry, various schemes have been sponsored by the Central and the State Governments under the First, Second and Third Five-Year Plans. For the successful implementation of these schemes, attempts have also been made in the past to import incubators of various capacities either under foreign aid programmes or through the release of foreign exchange. The total number of incubators already imported and proposed to be imported is, however, out of all proportion to the estimated *ultimate* requirements of 400 million egg capacity incubators. The achievement of this target will involve the procurement of about 10,000 incubators of 2,500 egg capacity every year for a period of 15 years. This provides a vast scope for the development of indigenous manufacture of incubators. The same holds good about other categories of equipment which are essentially needed in the poultry industry.

2. With a view to exploring the possibility of manufacturing incubators as well as other poultry equipment within the country, the Government of India in the Ministry of Commerce and Industry have recently set up a Committee to review the progress so far made in the manufacture of such equipment and to make recommendations to Government on the progress of manufacture to be undertaken so as to make the country self-sufficient in this line in the next two years or so. The Committee proposed to collect detailed information from firms at present engaged on the manufacture of this equipment. Before, however, they suggest any concrete steps for developing the industry, it will be necessary to have an idea about the probable requirements of the State Governments etc. spread over the next 15 years or so. The requirement will have to be worked out in such a manner that (i) 95–98% of total number of chicks produced in the country are produced through incubators as in other advanced countries against only 2% at present and that (ii) the poultry population in the country is increased to 20 times so as to provide one egg a day to 50% of human population. A list of the equipment which is usually needed for the development of the poultry industry is enclosed. I am to request that the estimated requirement of the State Government for each of the items indicated in the list may kindly be worked out and forwarded direct to Dr. Tulsa Ram, Poultry Development Officer, in this Department and Member-Secretary of the Committee mentioned above as early as possible and not later than 25th April 1962. I am further to request that while framing the estimates the requirements of the private industry may also please be taken into account, wherever possible.

3. A copy of this letter is being sent to the Director of Animal Husbandry of your State to avoid delay, with the request that he may send an *advance* copy to Dr. Tulsa Ram.

Yours faithfully,

Sd/- K. C. SARKAR,

Under Secretary to the Govt. of India.

Copy forwarded to the Directors of Animal Husbandry of all the States/Union Territories, with the request that the required information may be compiled and sent to their respective Governments/Administrations by the due date, with an advance copy to Dr. Tulsa Ram.

BY ORDER,

Sd/- K.C. SARKAR

Under Secretary to the Government of India

*List of Poultry Farming Equipment needed for the Development
of Poultry Industry in the Country*

I. Production and multiplication	Size/capacity	Demand		
1. *Incubators	1500—5000 egg capacity	Prospective requirement of the State and private breeders during 3rd and 4th plans to be indicated.		
2. Automatic Electric generators as stand by.				
3. *Floor brooders (foster mothers) thermostatically controlled.				
(a) Electric	100—300 chick	Unlimited.		
(b) Coal	200—400 chick	Will be needed in hilly areas with severe cold climate.		
(c) Kerosene oil	100—300 chick	Will be needed where electricity is not available.		
(d) Gas	100—300 chick	Where gas will be available.		
4. *Battery Brooders 3—5 years ..	300—500 chick	Will be needed in hatcheries by poultry farmers and for experimental purpose.		
5. Essential spare parts of the above equipment.				
II. Farm Equipment				
1. Galvanised wire netting—(Chick wire).	½", ¾", 1" 1½" and 2" mesh.	Unlimited.		
2. Feeders : (a) Chick feeders (b) Grower feeders (c) Adult flock feeders (d) Hanging feeders	Specifications to be laid.	Unlimited.		
3. *Automatic feeding equipment				
4. Waterers : (a) Chick fountains trough. (b) Grower and adult fountains (c) *Trough waterers with gravity valve, automatic auto valve or automatic float valve.			1—3 gallon	Unlimited.
5. Nests : (a) 1, 2 or 3 tyro nests, units of 5, 10 and 15 holes. (b) Traps for nests (c) Community nests				
6. *Poultry Crates	Specifications to be laid	Unlimited.		
7. Laying cages.				
8. Egg collecting wire baskets	50—100 eggs	Unlimited.		
9. *Electric debeaker				
10. *Poultry weighing scale ..				
11. Catching and handling rod	Specifications to be laid	Unlimited.		
12. *Fogger, cooling.				
13. Infra and Ultra violet germicidal lamps.		Lens-specs.		

III. Transport of day old chicks—	Size/capacity	Demand
1. *Chick baskets (card board) ..	100 chick capacity	Will be required in commercial hatcheries for transport of chicks throughout the country.
IV. Breeding Equipment—		
1. Pedigree cages	Half a dozen to one dozen egg capacity.	Will be used by hatcheries and breeding farms.
2. *Wing bands } 3. *Leg bands }	Specifications to be laid	Do.
V. Marketing of eggs and poultry—		
1. Eggs : (a) *Electric and hand worked graders.		Immediate requirement for undertaking marketing schemes and demand will extend in large towns and cities. Do.
(b) Automatic grading and panning machine.		Do.
(c) *Electric and mechanical egg washers.		
(d) Egg cartons (card board) ..	Half a dozen to two dozens.	Unlimited.
(e) Egg cases (wooden and card board).	Specifications to be laid	Immediate requirement for undertaking marketing schemes and demand will extend in large towns and cities by the private egg trade. Immediate requirement for undertaking marketing schemes and demand will extend in large towns and cities by the private egg trade. Do.
(f) *Fillers and flats		
(g) Candling lamps of facility testers.		
(h) *Egg weighing scale ..		Immediate requirement for undertaking marketing schemes and demand will extend in large towns and cities by the private egg trade. Will be required in all Government Poultry Farms and private large commercial farms for temporary storage of eggs.
(i) *Egg room collars specification to be given.		
(j) Egg oiling machine.		
2. Poultry :		
(1) Processing plant equipment		
(a) Chicken shackles.		
(b) Chicken dressing knives.		
(c) Eviscerating equipment.		
(d) *Electric feather pickers.		
(e) *Rubber picking fingers.		
(f) *Electric manual scalders.		
(g) Singeing nozzle.		
(h) Chilling vat.		
(i) *Deep freeze cabinets.		
(2) *Automatic poultry processing plant.		
VI. Feed Manufacturing Equipment.—		
1. *Feed Mixers	1—1 ton capacity.	
2. *Feed grinder (hammer mill).		
3. Platform weighing scale.		
*High technical equipment.		

ANNEXURE II

(Please see para 2.1 of the main report)

No. 18-16/61-LDII

**GOVERNMENT OF INDIA
MINISTRY OF FOOD AND AGRICULTURE
(Deptt. of Agriculture)**

New Delhi, the 3rd April, 1962.

FROM

DR. TULSA RAM,
Poultry Development Officer

TO

(as per list attached)

DEAR SIRs

I am directed to say that the question of developing the indigenous industry in the manufacture of incubators and other poultry equipment has been under the consideration of the Government of India for some time past. It is proposed to review the progress so far made in the manufacture of such equipment. After collecting necessary information from all engaged in and connected with the trade, it is proposed to draw up a programme of manufacture of such equipment so as to make the country self-sufficient in this line to the extent possible.

For this purpose the Government of India in the Ministry of Commerce and Industry have set up a Committee. We, therefore, seek your assistance and cooperation in the formulation of this programme and will be grateful if the enclosed questionnaire is duly filled in and returned to this Department in a sealed cover as soon as possible and not in any case later than 21st April, 1962. I am to add that any information that you might like to furnish will be kept strictly confidential.

Yours faithfully,

Sd/- [TULSA RAM]

Poultry Development Officer.

QUESTIONNAIRE

1. Please state the items of poultry equipment at present manufactured by your firm, indicating broad specifications thereof where necessary.
2. What is the number or quantity of various items manufactured annually.
3. What is the extent of annual demand for each item and whether you are receiving the demands from Govt. departments etc. or from private breeders, breeding associations, co-operative farms, etc.
4. Whether, with the existing resources, your firm is in a position to meet the entire demands placed on your firm both by Government agencies and by private persons/bodies.
5. What is the extent of imported components being used by your firm in the manufacture of such equipment, particularly incubators. To what extent can such imported components be replaced by indigenous counterparts.
6. Whether your firm is in a position to undertake the manufacture of large incubators as per specifications attached.
7. Whether your firm have necessary facilities for obtaining expert technical opinion in the manufacture and testing of the incubators.
8. Whether incubators manufactured by you, if any, are put to any trial with regard to their humidity and thermostatic control before they are sold out and if so, where.
9. Whether you feel any need for Government control and supervision over your manufacturing programme so as to make sure that the incubators are in accordance with the prescribed specifications.

10. Can your firm arrange to undertake large-scale manufacture of poultry equipment particularly incubators in partnership with any reputed foreign firms. If so, please state the names and addresses of such firms who may be known to you, the broad terms and conditions under which they are willing to cooperate with you and the extent to which you can invest on such manufacturing programme.
11. Any suggestion(s) which you may like to make for the development of the indigenous industry in the manufacture of incubators and other poultry equipment.
12. Whether any assistance from Government will be needed for the proposed manufacture of incubators etc., if so, in what form.

SPECIFICATION FOR INCUBATORS

(See question No. 6)

Requirements

The three basic requirements for a satisfactory working of an incubator are maintenance of regulated temperature moisture and oxygen supply to ensure proper hatching.

(a) Temperature

Correct, even temperature is a vital necessity to commence and maintain the growth of life of the chicken embryo. Excess heat and under heating will cause embryo to die off or cause production of unhealthy chicks. Temperature should range between 99.50 to 99.75° F or just below 100° F to produce satisfactory results, to be controlled by thermostat. Must have double control system.

(b) Oxygen

It is of vital importance that the air inside the incubator cabinet be pure and free from excess carbon dioxide so that oxygen is freely available to the growing embryo.

(c) Moisture (Humidity)

Humidity control shall be carried out by use of either spray method, or tilting water pans or any other feasible positive method of humidity control. Relative humidity should be 55—60% corresponding to wet bulb thermometer reading of from 80° to 95° F.

(d) Air Circulation

A balanced air flow distribution system gives even temperature through the incubator cabinet. It should be provided by use of fans. Air outlets must be adjustable and of sufficient size to allow proper conditions of incubation and hatching.

(e) Turning

Arrangement should be automatic or by hand, the former is preferable.

Material used

The cabinet should be made of either wood or metal. Wood, if used, should be seasoned, termite and moisture proof. If metal constructed aluminium or galvanised iron will be acceptable, galvanised iron should be spray painted and properly fastened with brass or bronze fasteners. The cabinet should be properly insulated with non-compacting, water proof and termite proof material. The material shall have insulation value equal to or exceeding $\frac{1}{2}$ " thick cotton wool/padding. Egg trays for full capacity and hatching trays for $\frac{1}{2}$ capacity should be provided. These trays should preferably be made of metal. Arrangements for transfer of eggs from incubation to hatching trays should preferably be mechanical. Heating arrangement should be with open coil type, low intensity, electric heaters say of 1,200 watt capacity each preferred. Heating arrangement should be supplied with electric heating and with kerosene oil arrangement as stand by. Strength of current—220 volts A.C. 50 cycles, single phase. *Size.*—Incubators of not less than 1500 egg capacity each will generally be preferred. These may be of 2,000, 2,500, 3,000 and 4,000 egg capacity and above each.

ANNEXURE III

(See para 2-1)

List of the Firms who replied to the Questionnaire

- | | | | |
|-------------------|----|----|---|
| 1. Andhra Pradesh | .. | .. | M/s. Scientific Electricals, Shalibanda, Hyderabad, Deccan.
Gwalior Poultry & Appliances, Kotla Alijah, Jubilee Post, Hyderabad. |
| 2. Bihar | .. | .. | M/s. Mandar Poultry Home, Mandar Hill P.O., Baunsi, Distt. Bhagalpur. |
| 3. Gujarat | .. | .. | The Poultry Equipment Co. Harni Road, Baroda-1. |
| 4. Madhya Pradesh | .. | .. | M/s. B. K. Doss & Bros., 270, Sanyogita Ganj, Indore. |
| 5. Madras | .. | .. | The Negapatam Industrials, 1 E 2, Navasughaperumal Koil Street, Choolai, Madras-7.
Livestock Fee Equipment Co., 202, Poonamalle High Road, Madras-29. |
| 6. Maharashtra | .. | .. | M/s. M. V. Dhavjekar & Co., National Park, Borivali, Bombay-66.
Maharashtra Steel Works, Poultry Equipment, Baramali (Distt. Poona). |
| 7. Mysore | .. | .. | M/s. Shashi Poultry, Sunkal Farm, Bangalore-2.
M/s. Azra Poultry Equipment, 1, Miller Tank Bund Road, Bangalore-1. |
| 8. Orissa | .. | .. | M/s. Aero Voice & Engineering, College Square Cuttack-3. |
| 9. Panjab | .. | .. | M/s. Hargolal & Sons, Hargo Lal Road, Ambala Cantt.
M/s. Masand Industries, Jullundur.
Gurdaspur Engineering Production, Cooperation Industrial Society Ltd., G.T. Road, Gurdaspur.
Instruments & Appliances, 125, Staff Road, Ambala Cantt. |
| 10. Uttar Pradesh | .. | .. | M/s. Taj India Incubators Works, Moti Lal Boss Road, Lucknow.
M/s. Aurora Industries, 8/98, Arya Nagar, Kanpur.
United Refrigerators, Mahatma Gandhi Road, Lucknow. |
| 11. West Bengal | .. | .. | M/s. Universal Traders, 60 D, Colootols Street, Calcutta-1.
M/s. Chopra Motors, 139, Regent Park, Calcutta-40.
M/s. Adair Dutt & Co. (India) Pvt. Ltd., 5, Dalhousie Square East, P. B. No. 2009, Calcutta-1.
M/s. Uday Scientific Industries, 5, Bhabanath-Sen Street, Calcutta-4.
The Artico, 5 Dalhousie Square East, Calcutta.
M/s. Cirugia De Lux Private Ltd., 24, Chowringee Road, Calcutta-13.
M/s. Process Control Equipment Co., 55, Joy Mitter Street, Calcutta-5. |
| 12. Delhi | .. | .. | M/s. Dyal Poultry Appliances, Lajwanti Garden, New Jail Road, New Delhi-18. |

ANNEXURE IV

(Please see para 4.6 (i) of main report)

List of Equipment of which samples will be needed for local Experimentation and Fabrication

I. Production and multiplication

1. Incubators of different makes and designs by various firms.
2. Floor brooders (thermostatically controlled) of coal, kerosene oil and gas.

II. Farm Equipment

1. Automatic feeding equipment.
2. Automatic auto valves.
3. Automatic float valves.
4. Electric debcakers.
5. Poultry weighing scale.
6. Catching and handling rods.
7. Foggers.
8. Infra lamps.
9. Ultra violet germicidal lamps.
10. Hen specs.

III. Transport of day old chicks

1. Chick baskets of 2 or 3 different shapes and designs.

IV. Breeding equipment

1. Wing and leg bands of 2 or 3 different designs.

V. Marketing of eggs and poultry

(a) Eggs

1. Electric egg graders.
2. Electric egg washers.
3. Egg cartons of different designs and sizes ($\frac{1}{2}$ dozen to 2 dozens).
4. Egg cases (card board).
5. Fillers and flats.

(b) Poultry

1. Chicken shackles.
2. Chicken dressing knives.
3. Chicken eviscerating knives.
4. Rubber picking fingers.
5. Electric feather pickers.
6. Electric manual scalders.



ANNEXURE V

(See para 4·7 of main report)

List of essential components required in the manufacture of incubators and other equipment which are not being produced in the country at present

I. Production and multiplication

1. *Incubators* : Precision thermostats and humidistats (controls), micro switches, mercury relays and switches, angle thermometers, electric/contact thermometers, bymetal strips, heating elements, fine wire (nichrome and kanthal wire), time switches and clocks, asbestos wire, reduction gears, humidity valve (magnetic valve).
2. *Battery and floor brooders* : Wafer capsules, sealed motors 1/30 and 1/40 H.P.

II. Farm equipment

1. *Waterers* : electric debeakers, by-metal strips, auto-valve.

III. Marketing of eggs and poultry

(a) Eggs

1. *Electric graders* : grader motors 1/12 H.P.
2. *Electric egg washer*—electric motor 1/12 H.P.
3. *Egg room coolers*—compressor and controls.

(b) Poultry

1. *Electric feather pickers*—rubber picking fingers.
2. *Deep freeze cabinets*—compressors and controls.



ANNEXURE VI

(See para 4·8 of main report)

List of equipment not likely to be manufactured without the import of essential Components, Greater Technical knowledge and/or foreign collaboration.

I. Production and multiplication

1. Incubators (forced draft type above 1,000 egg capacity).

II. Farm Equipment

1. Automatic feeding equipment (mechanical feeders).
2. Electric debeakers.
3. Foggers, cooling.

III. Breeding Equipment

1. Wing bands.
2. Leg bands.

IV. Marketing of eggs and poultry

(a) Eggs

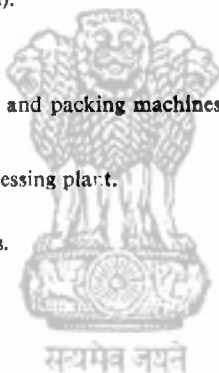
1. Electric graders.
2. Electric and mechanical egg washers.
3. Egg cartons (fibre board).
4. Fillers and flats.
5. Egg weighing scales.
6. Egg room coolers.
7. Egg oiling machines.
8. Automatic egg grading and packing machines.

(b) Poultry

1. Automatic poultry processing plant.
2. Electric feather pickers.
3. Rubber picking fingers.
4. Electric manual scalders.
5. Deep freeze cabinets.
6. Poultry weighing scales.

V. Feed manufacturing equipment

1. Feed mixers.
2. Feed grinders.
3. Hammer mills.



ANNEXURE VII

(See para 4·8 of main report)

List of Equipment for which import can be dispensed with

I. *Production and multiplication*

1. Incubators (below 3,000 egg capacity provided essential components and technical service made available.
2. Floor brooders (foster mothers) thermostatically controlled.
 - (a) Electric.
 - (b) Coal.
 - (c) Kerosene oil.
 - (d) Gas.
3. Battery brooders, 3—5 tyres.

II. *Farm Equipment*

1. Galvanised wire netting—(chick wire).
2. Feeders.
 - (a) Chick feeders.
 - (b) Grower feeders.
 - (c) Adult flock feeders.
 - (d) Hanging feeders.
3. Waterers
 - (a) Chick fountains and troughs.
 - (b) Grower and adult fountains.
 - (c) Trough waterers with gravity valve, automatic auto valve or automatic float valve.
4. Nests :
 - (a) 1, 2 or 3 tyre nests, units of 5, 10 and 15 holes.
 - (b) Traps for nests.
 - (c) Community nests.
5. Bird Crates.
6. Egg collecting wire baskets.
7. Catching and handling rods.

III. *Transport of day old chicks*

1. Chick baskets (card board).

IV. *Breeding Equipment*

1. Pedigree cages.
2. Wing bands.
3. Leg bands.

Restricted import.

V. *Marketing of eggs and poultry*

(a) *Eggs*

1. Egg cases (wooden and card board).
2. Candling lamps.

(b) *Poultry*

1. Processing plant equipment.
2. Chicken Shackles.
3. Singeing nozzle.
4. Cilling vat.

VI. *Feed manufacturing equipment*

1. Feed mixers.
2. Feed grinders (hammer mill).
3. Platform weighing scale.

} Provided essential components made available.

ANNEXURE VIII

Test Report of Incubators prepared by M/s. Dyal Poultry Appliances, Delhi. Two hatches tested: as compared to the James Way Incubators

I. Hatch	James Way Incubators			M/s. Dayal Incubators		
	No. of eggs set	No. of chicks hatched	%	No. of eggs set	No. of chicks hatched	%
White Leghorn	360	286	80	288	208	72.2
Rhode Island Red	360	300	83.3	372	296	79.5
New Hampshire	180	155	86.1	288	229	79.5
II. Hatch						
White Leghorn	360	286	80	384	259	67.5
Rhode Island Red	360	300	83.3	384	303	75.5
New Hampshire	160	131	81.8	384	290	78.9

On the whole the Incubator seems to be very good.

Sd/- Poultry Development Officer
Delhi State.

Record of Hatchability Trials as conducted at Govt. Poultry farm Jullunder for various incubators (1500 egg capacity)

S. No.	Firm	No. of eggs set	No. of eggs hatched	Percentage hatchability
1.	M/s. Hargolal & Sons, Ambala Cantt.	200	53	26.5
2.	M/s. Masand Industries, Jullunder	200	3	1.5
3.	M/s. Gurdaspur Cooperative Engg. Works, G.T. Road, Gurdaspur.	200	105	52.5
4.	Control (Secura)	200	127	63.5

Signed : 1. Store Inspection Officer, Jullunder.
2. Poultry Technician, Govt. Agricultural College, Ludhiana.
3. Poultry Development Officer, Punjab, Gurdaspur.

Proprietors Signed 1. M/s. Hargo & Sons, Ambala.
2. M/s. Masand Industries, Jullunder.
3. M/s. Gurdaspur Cooperative Engg. Works, Gurdaspur.

Signed. Manager, Government Poultry, Farm, Jullunder.