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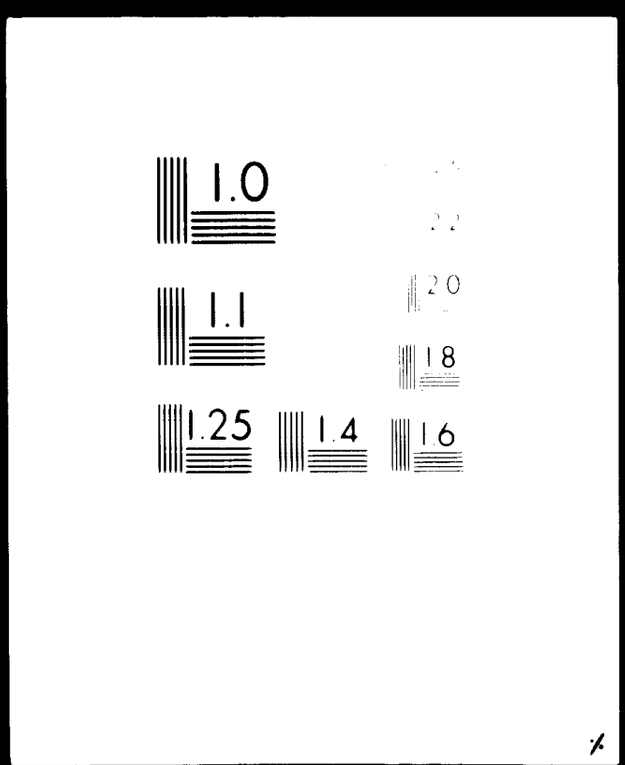

DRAFT REPORT

FOR

UNIDO

PROJECT SIS 70/998

STATUS OF MEAT FACTORY "SALCONSERV"

ROMANIA

December 30, 1971
Arthur G. McKee
Chicago, Illinois
U.S.A.

Contract 3906

1.0 ABSTRACT

This report within approximately 100 pages of text, 25 tables and four drawings, outlines with recommendations for action, all engineering costs, and economic data what should be done with the Medias "Salconserv" plant, the incorporation of meat extract facilities, and the usage of soya proteins. It is a three-subject report.

The study concludes that the present plants in Medias are too old, damaged, badly laid out, and poorly situated to rebuild. All efforts should be directed to this new plant. However, leaving the plant in its present condition or spending three quarters of a million dollars are possible, but not recommended options. A feasibility study with two layout drawings, cost studies and profitability is included in the work. The new plant situated on 4.1 hectares, with 8,400 square meters of main plant and 2,600 square meters of ancillary building, costing a total of about $3,500,000, would pay for itself in two years' time at today's price levels.

Detailed designs and layout drawings for the installation of a small 1,200 pounds per hour pilot extract plant, costing $55,000, installed are included in this work together with specifications and designs of some equipment. This plant should pay for itself in two years and ultimately generate a profit at $30,000 a year and reduce the sewage effluent to improve its quality as well as supply another food product to the market.

Seven different recipes are included for the use of soya concentrate or flour in the Appendix and a general method for mixing the soya into the meat. The present method used is satisfactory for soya flour, but is more complicated than necessary for the concentrates and isolates.

In addition to recommending proceeding with these three programs, it is recommended that the Romanian Government proceed with these other programs: a training program for Food Plant Maintenance Supervisors and a study group of two engineers to learn improved methods of refrigeration and cooling techniques in the U.S.A.

Finally, a critique of the general meat industry is included: although outside of the scope of work, it praises the high quality of products, the high level of technical meat personnel, the design of the newer meat plant, but ends with a word of caution about the huge size of some of the plants, the poor quality of details of construction, and the difficulty of maintaining a uniformity of quality from multi-plant operations.

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3.0 PURPOSE: General

The purpose of this report is to describe and document the work and suggestions that have been made by Arthur G. McKee Company, in collaboration with the Romanian meat experts, to the Government of the Socialist Republic of Romania in regard to the rehabilitation and short and long term expansion programs of the "Salconserv" factory in Medias. Special attention is given to a design of a meat extract and the use of soya protein with meats.

3.1 *Scope of Work under Contract*

The scope of work for the rehabilitation of the present plant includes: investigation of the present condition of the plant (Section 4.3), preparation of instrumentation and spare parts lists to return to a safe production, and elaboration of a work program for reconstruction in order to function normally. A further scope of the work was to include the engineering and technical details of a meat extract plant including flow sheet, layout cost sheet and specifications (Section 8.7), and elaborating on a work schedule and staff training (Sections 5.5 and 5.7). Finally, the overall plant modernization is considered in regard to layout, condition, staff, by-product utilization, maintenance, and production program (Section 5.3) with definite recommendations in regard to the final modernization (Section 6.2), the use of soya protein and meat extracts (Section 6.5), and with an elaboration and analysis of the economic aspects (Sections 8.3 and 5.3) with a work schedule program and specific recommendations (Section 6.2).

In summary, the purpose of the work was to determine and recommend, with supporting data, what should be done with: (1) the Medias Plant, (2) an extract plant, and (3) the uses of sova protein in meat.

3.2 *Additional Scope of Work*

At the mid-point of the study, it was decided by all concerned that because of the inadvisability of putting large amounts of money into rehabilitating the 70-year old plant and the need for an inspection-approved plant for export , the scope of the work would be broadened to include a feasibility study with layouts and economic data of a complete new plant in the Medias area on higher ground.

4.0 DESCRIPTION

In general, this section describes the work that was performed. It also describes the overall Romanian meat industry in comparison to other world producers; the Medias "Salconserv" plant at present, and as it is planned and recommended for the future. A future pilot extract plant is engineered and the soybean protein usage program is also discussed.

4.1 Work Performed

The work performed thus far consists of 45 working days in Romania by the Arthur G. McKee's technical advisor, Louis L. Crawford and three days of briefing in Vienna, as well as many man-days in the month of October making drawings and the initial designs of the new plant.

In Romania the work consisted of visiting the following meat plants: Medias, Sibiu, Deva, Brasov, Bucharest Timosoara, Galati, Constanta, and Hatag. The refrigeration and meat-packing machinery manufacturer, TECHNOFRIG, in Cluj was visited, as well as the Bucharest can-making company and the Maisesti gelatin phosphate manufacturing company. Also, several informal visits were made to the local abattoirs in various cities to compare their facilities with those of the export plants.

This plant visitation work was primarily to understand the technical level of the present meat industry in Romania and have a feeling for the inspection of processing procedures and the general level of competence.

Also, careful attention was given to the various construction procedures, not only in quality of workmanship, but in quality of available supplies.

Ten tables, two charts and one of two layouts for the new extract plant were made. This work was then summarized and documented in the included one-hundred page report.

In addition to this work, several meetings were held with the Ministry of Food Research regarding the soybean problems. Several questions were answered, and the method for analysis of soybean products in meat was submitted.

It is hoped that through this work a nucleous would be formed to build a new plant for Medias which would incorporate the extract plant in its general operations.

The details supplied on the extract plant are actually sufficient to begin working and installation.

4.2 *General Meat Industry in Comparison to Other World Producers*

In general, it is thought that the Romanian meat industry is technically very sophisticated and now is making some of the best processed meat in the world. The salami has a high degree of consistency and quality, and this is also true of their products for export: the canned ham and pork loins cannot be surpassed by the Poles and Danes. The level of sanitation varies, as will be discussed later in this report.

The general plans of the Meat Ministry are to build 11 meat plants within the next five-year future. Two of these plants, Galati and Suceava, were inaugurated in the fall of 1971. The new canning plant in Constanta is only a few years old, and the Bucharest huge sausage plant was also inaugurated in 1971. These plants show a high degree of technical knowledge in design and construction of meat plants; however, they tend to be larger than necessary. The reason for this is that money is allotted,not only for the present capacity of the

plant, but also for its expansion; the plant is built for a five-year future. This policy is questioned as it leads to oversized, overexpensive plants. It would be better if provisions were made for an expansion of the plant when needed, and build the plant for its present capacity plus 20 percent.

Also, the construction of the plant is not made according to the drawings and specifications. Either that, or the specifications are loose and there is little inspection. Many times, because of the urgency to complete a plant, approval has to be given to items such as floors where there is no proper drainage, even though they may have a 1:100 slope. More attention should be given to the details by the contractors, and the Food Ministry should insist that the specifications be followed.

In general, though, the plants are of high quality, especially the one in Suceava.

It is difficult to determine what happens to the inedible by-products. Apparently most of them are shipped to Marasesti where they are made into gelatin or fertilizer. This is an expensive haul and probably not worth the cost, although the purchase price of about $01.5 a pound is high when figuring the final use of the product and the cost of hauling.

In general, the cutting floors could use more cooling and refrigeration and less windows for sanitary purposes. The grounds around most of the plants are well kept and sanitary. The workers' welfare facilities do not meet the U.S.A. standards, but do meet most of those of the European countries. Some simple changes can be made in the plants for which U.S.A. approval is needed.

4.3 *Medias Plant "Salconserv" at Present*

In general, the Medias plant is in no condition to be rebuilt; it has passed over the point where it can be made sanitary with a moderate amount of changes.

The floods reached approximately three meters in most of the buildings, which due to their construction 60 years ago, also has destroyed some of the foundations. There are large cracks in the foundations, both in the curing cellar and the outside street wall of the cutting room. Some of the tile is cracked off and the curing cellar should not be used.

There are very few floor drains in the building and practically no slope on many of the floors,so the water pools throughout the plant.

Although many of the walls are tiled, they are still in poor shape. It is apparent that the walls, ceilings,and floors in each of the rooms in which meat is processed will have to be replaced. For replacing the floors,it will be necessary to install more drains; in every meat room there is a need for better plumbing; there is no hot water system in much of the area, which means that a whole hot water system is needed. More steam needs to be added so that hot water must be available in each room. In general, all doors and door frames where meat passes must be replaced with stainless steel.

In the coolers there is insufficient refrigeration to bring down the temperature of the product that has warmed up in any reasonable length of time. There are two good compressors, but the evaporators are in poor shape in both coolers. There is no refrigeration in the balance of the plant, which will have to be added. Additional compressor capacity is needed as well as evaporator capacity.

The lighting throughout the plant is substandard and will have to be increased, which means new wires throughout.

The window treatment is poor and some of the windows have no screens, but more important, all the windowsills are horizontal, and most foreign regulations require them to be on a 45-degree angle. Probably the best thing to do, if the plant is to continue operating, would be to close off the windows and put in artificial ventilation. Particularly, the cutting room has to be insulated and chilled to 45 to 50 degrees instead of being heated as at present.

A complete new cutting table is needed as the present one would be considered unsanitary by most meat inspection departments.

The cooler capacity is totally inadequate.

Exhibit 9.8 is a detail of the entire plant grounds.

In exhibit 8.2.1 a list of the amount of the expenditures required in each room is included by category or type of improvement needed. These expenditures will come to a total of US $ 70,000 for the sausage plant and another US $100,000 for the Sibiu salami plant.

The Sibiu salami plant is even in poorer shape in many ways, as there is practically no water supplied for the clean-up, and the walls in the meat preparation room are flaking and in extremely bad condition. Many rooms are much too small. In some cases there is no room for meat storage before processing. There is insufficient hot water and insufficient compressor capacity.

In general, the lighting in the Sibiu plant is sufficient, and the Sibiu salami stuffing line is in excellent condition, but the building conditions are bad. Foundations have been made out of soft brick. The plant has been flooded several times in its history.

In both plants the toilet and personnel dressing rooms are totally insufficient and would require changes as far as U.S. inspection laws are concerned; perhaps not as far as the German and English standards are concerned, as they are not as definite on the subject.

If it is decided that because of the lack of funds the plant must be rebuilt for processing meat for export, then every wall, every ceiling, every floor should be refinished, as well as the lighting and plumbing; this, of course, is not recommended. The plant is still on a flood area and subject to additional floods.

The roof and certain sections of the plant must be improved, but in general, they are satisfactory. The grounds must be cleaned up to pass inspection and a new gate put on the rear. In general, those areas in the southside of the plant which are unpaved would be paved, as this is an open inspection area.

The rendering pick-up area must be cleaned up and improved so that it does not have meat sitting around for rat and rodent infestation.

The walls in the Sibiu salami storage area must be refinished and more lighting installed.

The Sibiu salami plant for smoking must be changed entirely and cleaned up with the tile walls and windows, as well as the storage area.

4.4 *Future Plant - Meat Canning*

This new plant is detailed in two drawings in Section 8.3, and the data on them is available on Section 8.4.

The plant site, more or less, already has been layed aside and picked, and it is excellent. It is flat ground, of which 4.1 hectares are needed with an entrance gate in the center facing the present road.

The stockyards are a half-mile away from the present dairy, which is more than adequate.

Trucks enter one gate, dirty trucks with cattle circulate to the left where they unload the cattle, wash the trucks, weigh the trucks empty, as well as full, and then return out the front gate. Clean trucks turn to the right where they are washed, loaded and returned out the front gate.

There is a rendering plant and sanitary slaughterhouse shown on the back of the plant to the north, which can or cannot be used, depending upon the local rendering situation at the time. At present, it is recommended that if money is available this plant be installed with an operation to make meatmeal and inedible tallow for the soapers.

The plant is basicslly a one-floor plant with s mezzanine, or second floor, over the front part of the building. The basic ceiling height is approximatelv 23 feet.

Kill floors, with the mezzanine area over the cutting snd ssusage factorv area, mesns thst each floor would be approximstelv 11 feet.

The plant has approximatelv 8,400 meters of floor space, much of which is allocated to Sibiu salami. This is an extremelv expensive item to manufacture, but also the profit msrgin is extremely high--being almost 100 percent.

The new plant is designed for 100 cattle, 200 to 400 hogs per day;5000 tons of conserves, 4000 tons of sausage, and 350 tons of Sibiu salami per year. These cattle slaughtering figures sre based on the maximum slaughter rate available from the present supply of cattle and hogs, which is really not high enough to supply the top rates, but high enough to supply the lower rates of slaughter. It is planned that this slsughterhouse not only will take over the slaughtering projects of Sibiu, but slso Medias, for the local consumption as well as for the two canning plants.

The cost of equipment for a 150-cattle-per-day plant is the same as a 50- cattle-per-day plant. The same is true of the hog plant. Eight hundred per day has the same equipment as 200 per day. The minimum rate can be slaughtered just as easily as the top rate.

The equipment cost is just the same as is the space; the difference is in the amount of pig and cattle storage area, but these are kept to a minimum in this case because the slaughtering for the local consumption would not need chill rooms, but will be shipped warm.

The plant is scheduled for a ten-meter column center, which is large; but since there is little weight loading on the upper floor, it was expected that this would be a fairly economical base center to use. The final design of it, of course, can be changed.

The design of the building is all in accordance with the U.S.D.A. Handbook 191, Guide to Architects and Designing of Meat Packing Plants. These specifications in general seem to be adequate for all countries with minor changes. It is the most popular handbook written on the subject, and therefore, the specifications generally are taken over throughout the world.

In general, the construction can be similar to the Suceava plant and must have the same floor covering, which is ribbed tile with a polyethylene sealer in the grout. All the lights must be covered and floreacent in most areas to cut down the heat load.

All doors and door frames are to be covered with stainless steel, and 1:50 slope on the floors to the drains. Drains should be included every 50 to 75 square meters. Hot and cold water should be supplied. Hose connections every 300 meters, or in every small room.

The cattle and hog storage are separate from the plant so that there is room for expansion in the future, if needed, but yet close enough so it is economical to feed the livestock into the proper chutes.

There are two shipping areas: one for the canned sausage and Sibiu products, and the other for the fresh meat going directly to the local trade without refrigeration. Empty cans are stored on the top floor over the canning depsrtment, which has a can washing area and a freezer.

After much consideration, it was decided that the can-making facilities would be located more suitably in Sibiu, with the cans being shipped to Medias from Sibiu, and meat shipped in the same trucks back to Sibiu from Medias. The reason for this is that the can-making department in Medias is so small that it is difficult to maintain a complete machine shop, and therefore, keep the machines running. The same machines can be kept in better repair and be better maintained with better dies, so that the cans improve by locating them in a better can-making shop, such as that in Sibiu. There is room in Sibiu plant for this operation.

4.5 *Future Pilot Extract Plant*

The drawings and the data for this future pilot extract plant appear in Data, Sections 8.6 and 8.7.

The beef extract operations is to be located in the top floor near the Konti cooker in the Sibiu plant. This is an extremely good location as it is close to the steam supply, has adequate electricity, and good ventilation. Even though it is on the second floor, this structure is strong enough to support the load; furthermore, it is close to the Konti cooker and close to the outside where the material from the Medias plant can be pumped.

Beef extract is the concentrated cooking waters from the cooking of beef and beef variety meats. In this process of cooking these products in water, much of the nitrogenous material is protein that goes into a solution in water which is called "soup," and is then concentrated by evaporation under vacuum.

Beef extract is stimulating, easy to digest and very palletable, especially when flavored with different condiments.

It can be used in the manufacture of dry soups or sold directly, as it is in England, for spreading on bread, as butter. In other words, it is a healthful, high protein, finished product; consumer item as such, and can be used to make beef tea by the housewife, or it can be added to dry soups if further dried locally. It has an export value of anywhere from 35 cents to 1.5 dollar a pound and fluctuates widely on the international market. It is assumed that most of it will be consumed locally.

The waters that are ordinarily concentrated for the manufacture of beef extract are those from the cooking of beef in the course of the canning process. This soup has about 1.5 to 3 percent protein in it at the time. The method of cooking in the process of canning is the same, whether or not the cooking water is intended for manufacture of beef extract later. Cooking is usually carried on at a temperature of 200 degrees fahrenheit, for four to seven hours, or it can be done continuously on a Konti cooker, which is a revolving drum with hot water sprays. Some plants separate the different waters, making different grades of beef extract, while others use other different grades in the manufacture of one common product. This is what is recommended for Sibiu and Medias.

In the preparation of beef extract, it is customary to use the same water for cooking three to four batches of meat in a continuous cooker. This means that the recycling of the water is done until about a three percent concentration is built up in it. This saves in the steam consumption. The waters gradually become richer as they pass from batch to batch where recirculated. After sufficient cooking water has been accumulated for concentration, it is pumped into a heating vat and heated under pressure to approximately 180 to 212 degrees. At this point, after ten to twenty minutes, depending upon the extract temperature, or until they are albuminous matter, the water raises to the surface and becomes solid. This liquid, with the albuminous solids, is next pumped through a recessed plate, open-delivery, filter press, the albumin acting as a filtering medium to coat the press. This is similar to lard filtering.

All foam matter is filtered out and the result of the filtrate will be clear and brilliant. From the the filter press the clear, filtered, liquid is pumped into a vacuum, pan-type evaporator. Because this is a pilot plant, and considering the low cost of steam, single-evaporators are being used rather than the double-effect evaporators, where vacuums of 27 inches or higher are obtained.

If the multiple-effect evaporators were used, the first effect would require relatively low vacuum. The liquid is delivered to the vacuum pan at about 180 degrees. With the boiling point of water under a 27-inch vacuum being 108 degrees, there will a lively boiling as soon as such a vacuum is secured. The lively

boiling is constantly maintained by passing low pressure or exhaust steam through the heating elements in the evaporators. Boiling at this point causes the moisture to distill off rapidly. The moisture is condensed in a condenser connected to the evaporating units for that purpose.

Such distillation of moisture proceeds until the water content is reduced to about 60 to 70 percent of the total weight. This concentration corresponds to a specific gravity of 15 degrees Bé. Eighty pounds of moisture are evaporated for every 100 pounds of green cooking. In the vacuum pumps the concentrated liquid is transferred to a stainless steel open pan, actually three meters long by 1.5 meters wide with a revolving stainless steel spiral in it. The spiral has steam at two atmospheres pressure and the product is further concentrated until it is almost a solid with a moisture content of about 22 percent.

Then is is packaged either in cans or jars, depending upon how it is to be sold. If it is sold in bulk, it is sold in 56 pound cans--two cans to a wooden box; jars might be two to three ounces. These cans are standard five-gallon cans with a plug top two inches in diameter soldered into place. There is no vacuum on the can. Since production is low, one can per hour, the filling and can making is done by hand. Some experimentation has been done by using a plastic five-gallon gasoline container, similar to that made in Romania, but it is not accepted as standard as yet. The solid extract is the basis for the bouillon cubes, broths, soups, as well for the housewife's best condiment.

Bone extract can also be made, primarily from the hog head bones cooked in Medias. The process is much the same as the beef extract process, except for the fact that it is not concentrated as much. In other words, the final concentration phase is not utilized. Beef extract is defined by the U.S. Military departments and the Department of Agriculture, and may be imported or may originate in domestic establishments regularly operated under the supervision of the meat inspection division. The U.S. imported beef extract or bone extract, by law, should be subject to the current regulations of the meat inspection division of the U.S. Government. Beef extract shall contain not more than 18 percent moisture, not more than 25 percent ash, not more than five percent salt, seven percent total creatin and creatinin, and not less than eight percent total nitrogen.

The beef extract shall show no traces of nitrates or nitrites when tested and specified in the regulations. Other than this constitution, the beef extract shall have a characteristic flavor and odor, and shall not be scorched or burned.

Fluid extract, or bone extract, of the meat shall contain not more than 50 percent moisture, and preferably shall contain only 33 percent moisture, 12 percent salt, and the balance of bone solids.

The meat and bone extract plant, although a pilot size, can be duplicated in other plants in Romania. It is large enough to take the product in one shift from one shift of the Sibiu or Medias plant production. It is thoroughly described in the data drawings and specifications to the extent that the work can be ordered and final detailed drawings made for installation.

4.6 *Soya Protein Usage*

The description of the soya protein usage is provided in Appendix 9.1, and the methods are given for at least five different products. In the data given in Section 8.5, the type of soya is defined and described.

Most of the soya in the United States is concentrate, and not flour. The flour in Romania is made with expeller process in milling from the original steam water extraction and pressing operation. This flour is not used in the United States because of the scorching in the expeller, and it does not have the protein solubility. The present method of mixing the flour with the meat is an excellent one, and probably the best way to be done in Romania where the silent cutters are small, underpowered, and there is little control.

In the United States, the sova concentrate is merely mixed in powder form with the rough cutting of the beef in the beginning of the chopping operation. It is sprinkled on top of the rough meat as it revolves around the chopper immediately in the beginning, similar to the condiments. However, because the flour does not go into solution emulsion as fast as the concentrate does, it is important for the Romanians to continue adding their flour in the present manner. This is to take one kilo of flour, one kilo of water, one kilo of fat and emulsify them, mixing them together, allowing them to sit for six to eight hours, and then adding the proper amount, up to 3.5 percent flour to meat into the silent cutter as a stiff emulsion. The difficultv is that this emulsion is so stiff that , in several cases, the silent cutters are not strong enough to get good mixing within the time allowed them.

5.0 DISCUSSION

In any general discussion, it is necessary to state that the opinions expressed are based on the engineering data available at the time, but if sufficient additional input of information is made, these opinions could be changed.

The rehabilitation of the old plant should only take place if all possible methods of financing have been considered for building an entirely new plant. The second choice would be to maintain the present plant as is for five to ten years, until it deteriorates, and then close it. The least desirable choice open would be to rehabilitate the present plant.

The basic other opinions expressed are on less important matters and do not need further discussion, as the engineering input is concise.

5.1 *Rehabilitation of the Existing Plant*

The rehabilitation at the present time, a minimum operation, already has been completed to a large extent.

The plant is operating at about three-quarter capacity set for it as of 1970, before the flood. It is operating in unsanitary conditions, but to the best of the ability of the personnel involved. One of the principal advantages of locating a plant in the Medias area is that the personnel have been trained throughout generations, by father to son. The Medias area has a strong heritage for good meat products and probably is one of the best in Romania for exporting products to other countries.

The true value of any plant is its employees and technical background. Medias has this, but they lack a plant. The rehabilitation of the plant is as best as it could be at the present time. Except for the silent cutter, which is extremely needed in order to get a better blending of the sova protein into the product and obtain a more uniform product, the plant is reasonably current in technology.

The controls that were suggested for the smokehouses and the canning equipment in September were repaired in October,so they are in in adequate conditions at the present time. The canning machinery that was broken down in September has had a complete overhaul and is operating reasonably well. These changes are no longer needed.

However, the silent cutter is needed as it would upgrade the quality of the product. The actual silent cutter recommended appears on 6.1 as a money commitment. All profits are before taxes.

There is still much to be done if the plant is to continue operating in Medias as is. A normal maintenance program will keep it in an operable condition for local consumption, but not for export.

However, the need for export income is great in Romania, and one of the best places to obtain this export income is from sophisticated meat products such as pork paté, Sibiu salami, and other canned products with a margin profit as shown in Exhibits 9.6 and 9.9, which are actual data.

Margins of profit are good, particularly in the canning department, far greater than in most countries. These margins of profit are based on the local consumption, and it is understood that in export the margin of profit would be even greater. An arbitrary breakdown between the cost price and the selling price to the housewife is made of 60 percent for manufacturing and 40 percent for sales.

5.2 *Meat Extract Pilot Plant*

It was decided to locate the meat extract plant in Sibiu. As a pilot plant, it would be able to take both kinds of products there, and there is more beef extract than there is pork soup. Also, the location is better in the Sibiu plant. Since both plants are operated by the same management and controlled by the same group, a dual facility in Sibiu could be operated much better than in Medias. Furthermore, the steam supply in Sibiu is more sufficient. The system utilized is the one used in South America for making most of the corned beef extract, and is one of the simplest. Most of the equipment needed could be made in Romania.

The plant would cost about $45,000--maximum. Equipment totalling $17,000 will be made in Romania. The installation and start-up costs are $15,000.

The plant would yield approximately $35,000 worth of gross profit per year with a $30,000 net profit after steam coat, manpower and depreciation is deducted. This gives a pay-off period of 1.6 years. The total cost, including installation, is about $51,000; much of this depends on where the equipment is purchased, either in the United States or in Germany. Costs are figured on the value of $700 per ton for the extract, which is a general market price over the past five years. The return on investment of 1.6 years is a good one, and therefore, the investment should be made regardless of the availability of outside capital. It certainly could be paid for by exporting the extract. These calculations do not include the usage of Medias soupstock, which would decrease the return on investment to probably less than a year, or overtime operations on second shifts. The homestock probably will have to be used in Romania, as there is no export value on it at the present time except for some individual purchasers, such as Campbell Soup, the largest soup-making company in the world. There is no real export trade value of pork soupstock.

5.1 Overall Modernization of the Factory

It is difficult to determine entirely which option to proceed with, but the overall evidence is overwhelming to the fact that the present Medias plant is incapable of being rebuilt. From the engineering estimates, it would be close to $500,000 in building changes, and another $150,000 to $200,000 worth of equipment. The current value of present equipment in the Medias plant is $250,000 to $300,000, and can be transferred to the new Medias plant.

Also, the new Medias plant that serves several other functions would eliminate the present slaughterhouse in Medias, which is in extremely poor condition, although well painted on the outside. It would allow this property, which is in the center of the city, to be utilized for more important functions, as well as the rebuilding of a new slaughterhouse outside of Medias, allowing the present "Salconserv" factory area to be utilized for a more important function. Furthermore, there is no insurance that there would not be a further flood in the area.

One of the major difficulties in trying to rebuild the Medias plant would be to keep it operating while rebuilding it. An entirely new cooler would have to be built somewhere, probably in the present can storage area. This would open up the areas where the present coolers are for additional boning.

The only building in reasonably good condition is the present canning operation. It is thought that if there is insufficient capital to build an entirely new Medias plant, a new slaughterhouse, canning and sausage factory can be built, leaving the Sibiu salami factory out of the new plant, and putting a new Sibiu sausage plant in the present canning factory. The new Sibiu salami factory occupies 1,400 square meters of very expensive construction.

The present canning plant, or the old Medias plant, can be converted into a Sibiu salami factory, as the present storage area is also available on this area. The rest of the buildings can be torn down, and this probably can be done, in a reasonably inexpensive manner, and then dispose of the present Sibiu salami plant. This is not recommended, but is a possibility. What really is recommended is to build an entirely new plant as described. These are all alternatives in case the capital is not available, or forthcoming.

In general, it would be better to have both operations under one supervision and closely controlled. The history is that one owner/ brother ran the canning plant, and one the Sibiu plant. Because the brothers could not work together, the canning plants were separated. This, of course, is no longer a fact, and combining the two plants would save considerably in overhead and give a far better control.

The basic problem with rebuilding the present Medias plant is that the original layout is extremely poor. It was expanded over a 70-year period; there is no centralized storage area; no centralized receiving or dispatching, which could lead to difficulties in controlling and inaccuracies in shipping, and even to pilferage of product, much less the unsanitary conditions.

The present coolers are totally inadequate and must be rebuilt as they do not have enough refrigeration and are very unsanitary. It would be extremely unfortunate if the Medias plant had to be rebuilt. There is still the possibility that, if it were rebuilt, it would not pass government inspection no matter how much money was put into it without rebuilding it entirely.

If the can making were moved, the can storage area could be used for refrigerated warehouse for the raw meat.

The area between the smokehouses and the engine room could be filled in and the flow of the plant reversed. All of this would be far more than $500,000 minimum that would be spent on buildings just to bring it to pass inspection.

The main advantage of the new plant is that it also would allow slaughtering for the Sibiu operation, thus allowing the plant to export. At present, neither of the plants can export because the product is not slaughtered in a sanitary plant. It would supply sanitary meat and additional area for usage in Sibiu. Furthermore, the plant can be built without having any work stopages in the present plant. The stopages, because of rebuilding, would be extremely expensive. There is no possible way, without building a new cooler, of operating the plant and trying to rebuild the old coolers. If the job merely were to rebuild the old coolers, then the plant would have to stop operating for at least a period of two or three months, which is unprofitable, if not desirable.

5.4 *Plans for New Factory*

A new factory was designed primarily because the old factory will not be able to operate much longer and should be condemned; but secondarily, the new plant in itself is an extremely profitable proposition. The chance to obtain an export market, which is not opened to the Medias area at present, is a major one. Furthermore, the labor savings in the new factory would be significant as well. The sanitary conditions would improve the quality of the meat and avoid meat spoilage.

The plant was designed to be as small as possible and still have the variability of products that is necessary. The rate of capacity can be increased by 20 percent or more, if necessary.

The Table 8.4.6 and its accompanying charts show what can be done with product mix at various production levels, from 4,000 tons of sausage to 8,000 tons of sausage. By cutting down on the canned products, the profit margin is lower. In other words, if the people are supplied with more sausage, the canned goods are cut down, and the Sibiu salami is cut down, the profit is considerably lower. On the other hand, with the same total tonnage from the plant, if the product is increased in conserves and Sibiu salami, with an 11,000 ton production per year, it is possible to make 2.8 million dollars in a year profit before taxes. These figures are based on the actual prices and costs in Medias of all the products manufactured. Taken on three different items, the exact cost breakdown showed that the sales cost was about 40 percent of the total markup. Therefore, the 60 percent ratio manufacturing for sales was used for the actual manufacturing plant's profits. Chart 8.8 shows the variation of profit and pay-off period with a constant level of production and varying product mixes.

Production Mix #3, which is high in conserves and salami manufacturing, will pay off more rapidly than the other product mixes. Probably the production levels would go up 12,000 tons per year, which the plant is capable of producing. No profit is assumed for the slaughtering operation or transfer of slaughtered meats to Sibiu. This profit is merely figured on the basis of the tons of sausage, conserves, and Sibiu salami from the Medias Plant. This profit, even with the high depreciation rate for 20 years on the 3.0 million plant, still would be significant enough to pay for itself on a two-year period, at a normal volume. The main problem is to obtain the raw material. Perhaps in the overall planning, an increase in price of the raw material would stimulate further growth of livestock and still allow for a sufficient profit for the meat plants. This needs further investigation. The only limiting factor to this plant's profitability is the supply of raw material at a reasonable price.

The plant was designed to be a perfect jewel; small, but precise in every operation with a minimum amount of transfer of beef and by-products and yet to be completely integrated.

The construction methods are all to be compatable with the local building codes imposed; upon these would be the meat inspection codes. The cost of building by square meter is similar to the one in the United States; this may be somewhat high, compared with present building costs per square meter of some of the existing plants in Romania. However, in order to pass inspection, it would be expected that a few extras are needed over and above what is planned. Therefore, this higher cost is assumed, and it might be assumed that a 20 percent savings could be made, if absolutely necessary, on the investment by cutting down on certain items.

The equipment costs are based on West German prices. Unfortunately, some of the costs in the Romanian market are higher than on the U.S. market, even though the quality is no greater, if anything less. This means that the equipment costs are probably slightly low.

In general, though, both the capital investment cost of equipment and building should be accurate, plus or minus 15 percent.

The areas allocated for various processes are considerably larger than the present ones, but should allow for expansion. Still, they are not too large; there are 10,000 square meters worth of drying area for Sibiu salami which will allow for a year's inventory of salami. It is figured at .4 tons per square meter. However, it is expected that with the changes in the dry salami production in the next few years, this plant can produce twice as much as this if the product were put in boxes and stored, not hanging. This can be done with controlled atmosphere. However, the plant is layed out for the traditional method of producing Sibiu salami, with the alternative of ultimately going into certain minor changes which would give more tons of production per square meter.

The sausage plant is designed for a complete range of sausage, hams and bacon. It is doubtful whether this production of hams and bacon should be a multiple process and if it can be done so economically. However, the savings in space is not that great, but it is provided for in case it absolutely must be done.

The present canning equipment will be used in the new plant; a couple of new can washers and a new filler machine will be purchased, which will allow for continuous filling to reach the desired tonnage.

The present canning equipment is in reasonably good shape and there is no reason for not transferring it. It can be done very rapidly without much shut down, especially if there are two lines.

The list of equipment for the new plant, in Section 8.4.4, is not intended to be complete as far as description of each item is concerned, but are completed as to prices. This was not intended to be a complete design study, but primarily a feasibility study.

5.5 *Overall Meat Plant Expansion Program and Training*

The overall meat expansion program in the near period is to have eleven operating meat packing plants in the cities listed previously. Ultimately, the number would probably be expanded to 25.

There is a major caution on this type of expansion, and that is that it is almost impossible to get an identical duplication of product from one plant to another. The foreign purchaser for export is constantly looking for uniformity, and in his mind, uniformity is defined as quality. The various companies in the world that operate multiple plants are constantly having this difficulty. Exact manufacturing manuals must be produced and inter-plant inspection must be carried out by staff members who are technically minded to see that

each can made in one plant is the same made in another one. Therefore, it is recommended that, in general, a smaller number of larger plants is better than a multiple number of small plants --from a quality production standpoint.

Political implications may enter into the location of the plant, as well as the supply of the raw material, which is extremely important. In general, the plant should be put where the animals are raised. Many of the roads are good in Romania, and transportation is excellent. The closer to the supply of raw material, the better.

One important factor in locating the plant is the personnel available. Wherever the technical personnel is located, then usually there is a long history of manufacturing of meat in that area, and usually for a good reason.

In building new plants, the Romanian Government should put more emphasis on the following of the specifications and the quality standard of construction, rather than the exact time schedule, which is always difficult to meet. Rushing could mean that the plants could not pass inspection because the floors do not slope properly, or because the electrical wiring systems are too light, or the full in-plant cleaning system is not installed. It is better to be a month late and correct than to have to live with an incorrect plant for a lifetime.

Also, what is important is to have good maintenance once the plant is built. In Romania the maintenance personnel of the meat plants need to be trained further. The new plants are far more complex than the old ones, with far more complicated equipment. It is suggested that a Meat Maintenance Supervisor school or class be set up for trsining. These people should be taken to various plants where the machinerv is made and shown how to maintain this equipment as well as being taught the theory of preventive maintenance, records, and upkeep of inventory control.

A modern chief maintenance engineer of a meat plant is the heart of the plant. Preventive maintenance must be practiced to a high degree because a shut down of a machine for two or three hours could cause disasters in shipping schedules, and certainly a waste of employment. Besides this training program, it is thought that a training of two engineers from the Technofrig plant, in modern cooler room applications of evaporators and screw compressors, is desirable. Romania will benefit from this training over a period of years. Since there is only one primary manufacturer of refrigeration equipment in the country, it will help them to supply the most advanced equipment to the meat industry.

The United States is far advanced in the chilling of animals over most countries because of the long history of chilling carcasses. Most European countries did not chill animals until about 20 years ago. The overhead, or between-the-rail evaporator units, are so compact and trouble free in the United States that they should be considered for all new coolers in Romania. They lend flexibility and are easy to install. When a unit cuts out, there is still an additional unit to keep chilling so that the loss in refrigeration is minor. This insures a constant, high-quality material.

In general, the technology level of the operating personnel is very well trained as far as knowing how to make good sausage and making a good product. The sanitation level leaves something to be desired, as far as inspection procedures are concerned. Many inspection rules do not seem worthwhile, but nevertheless, they must be complied with if export to those countries is required. In general, though, the inspection requirements are sound, basic principles for sanitation, and in almost all cases, benefit the meat packer by improving the product and reducing spoilage.

5.6 *Soya Protein Usage*

Soya protein usages are described in the Appendix as well as the methods for applying them in various other sections under DESCRIPTION.

5.7 *Timing Schedule for Projects*

No written timing schedule charts have been made because this would tend to make the timing schedules seem to be more exact, and is not possible to set them at the present time.

The general schedule for finishing rehabilitation of the present plant should be three to six months. This means that the present plant would not pass inspection, but will continue to operate under a normal maintenance schedule. It is assumed that the silent cutter would be purchased within the next two months. The schedule for overall modernization of the present factory, which is not recommended, would be approximately a year and a half. The detailed engineering of each job should be done within six months; bids call for within two months, and the contracts let in a total of eight months. The balance will be to spread the work out to require as little work stoppage of the plant as possible.

The overall building of a new plant would require two years. The first six months should be for detailed engineering and specification writing. The next two months is for letting the bids, and the balance of four months for the construction and start-up operations.

The future pilot extract plant should be able to be completed and ready for operation within 10 to 12 months. The first three months will be spent in specification writing and ordering of the equipment; four months to receive delivery of the equipment, and the balance to install it.

The soybean flour operation has been accomplished already--as fast as it can be--considering that there is no concentrate, but merely flour in Romania. The next step is to build the soybean concentrate pilot plant which could supply the several sausage factories with a more superior product and then also be utilized in a broader range of product, as well as higher concentrations, if desired.

All these projects are worth continuing, and will show a rapid pay-off period--less than two years. If financing is not available in Romania, outside financing should be considered. Several sources are available besides UNIDO, which is able to put the two parties together, but is not able to finance any of these projects except possibly for the technical assistance.

6.0 RECOMMENDATIONS

6.1 *Allocation of Present Money Commitment*

It is recommended that UNIDO should consider allocation of $18,600 of its previous commitment of $45,000 to the Medias plant to replace the silent cutter that was destroyed in the flood. The silent cutter is needed so "Salconserv" can integrate soy protein into its sausage and improve its products. Also, $24,000 should be allocated for the purchase of a meat extract plant to concentrate the meat soup from Medias and Sibiu.

6.2 *Medias Canning*

It is recommended that the Romanian Government proceed as soon as possible with the detailed designs and engineering for a plant, as outlined in this study, to replace the present Medias "Salconserv" operation, and that UNIDO proceed to help the Romanians find alternate financing schemes--based on export of Sibiu salami and canned paté, both products of high quality and vast demand.

6.3 *Pilot Meat Extract Plant*

It is recommended that the Romanian Government proceed to order the equipment, both local and imported, for the soup from both plants, for the installation of the pilot extract plant in the Sibiu site. The reason being that there will be a pay-off period of about two years on the investment, and it will help the Romanians provide a higher quality sausage, soup, and meat-based products.

F.4 *Industry in General*

It is recommended that the Romanian Government under the auspices of UNIDO send two engineers from the TECHNOPRIC Company to the United States for two months to study in detail develop improved methods of cooler evaporator design and develop new refrigeration techniques Also that the Romanian Government set up a local program for development and training of maintenance supervisors for the meat and food industries under the auspices of the Food Design Institute

F.5 *Soya Protein*

It is recommended that the meat industry continue to add three and one-half percent flour, but at no greater level to its sausages as prescribed in the Appendix Also, that the research laboratory proceed with plans of financial help from UNIDO on a new pilot soya concentrate plant so that new soya products can be developed to broaden and improve the general diet of the Romanian people

7.0 Conclusions - General

In general the [illegible] meat industry - and in particular the [illegible] area - is sophisticated and knowledgeable in meat production - but the [illegible] Sanitary plant is old, ravaged by flood - and a poorly laid out operation. Therefore a complete new plant on higher ground which would pay for itself in two years is needed and planned - with an adjacent plant nearby and facilities for soybean usage.

In general the [illegible] have three choices (1) to build a new sanitary plant for higher production in order to meet all sanitary requirements for $1,500,000 (2) to leave the present plant as is with normal maintenance at $20,000 per year - and (3) to rebuild the present plant with little improvement in quality of production for $300,000.

7.1 Rehabilitation of the Existing Processing Plant

Rehabilitation of the catering plant already has taken place over the past year since the first discussions with [illegible]. In fact the repair of the refrigerating machinery - the instrumentation of the cooking retorts - and the warehouse [illegible] place in October 1971 between the time of the first recommendation and completion of this work.

At the present time - the plant is rehabilitated about as far as possible without entering into a massive utilities boiler program - as outlined in Section 7.3.

A new hundred pound plant cutter with a 30 horsepower two speed drive - imported at a cost of $10,000 f.o.b. - [illegible] is the most important need at present - to be able to add more [illegible] to improve the quality of the product.

7.2 *Plans for Meat Extract Pilot Plant*

The extract pilot plant was designed to fit in a space of five by ten meters in the Sibiu factory, close to the corned beef Konti cooker line with a capacity to keep pace with the cooking.

The processing of the soup from the Medias pork cooking will be done at night, and hauled by tank trucks the 45 kilometers to Sibiu.

The plant's imported evaporator would cost $20,000, as specified, laved out, and processed in Section 8.7. Local costs would amount to $18,000 for additional tanks and equipment, and approximately $14,000 for installation and building improvements. The total project cost would be $52,000 to $55,000. This plant would have a pay-out period of about two years from net profits, based on the past five-year average market price for extract, and a 15-year depreciation rate.

7.3 *Overall Modernization of the Factory*

Overall modernization of the factory would require over $500,000 worth of building improvements (Section 8.2.1), and over $159,000 (Section 8.2) of equipment in order to bring it up to a reasonable level of sanitation with a production goal of 4000 tons a year of canned meats.

When finished, the plant would still remain in a poor location, subject to floods; have insufficient cooler space; have an extremely difficult general layout--with meat moving in open spaces and all directions; and have no proper shipping and receiving rooms. Furthermore, the plant still would have difficulty in shipping "export," as the meat does not come from an "approved plant."

Tha present layout makes final approval of the Medias plant "doubtful" as to ever raceiving final approval. If an attempt is made to ovarall modernization of this plant, all wall ceilings and floors would have to be rasurfaced,electrical wiring redone to increase the lighting to ten watts per square meter, plumbing of hot water or steam made throughout, foundations shored on the outside walls, refrigeration increased in evaporator capacity, all doors replaced with stainless stael type doors and frames, and windows removed or given a 45 degree angle sill and proper screaning. Details and cost of these changes appear in Section 8.2.1. and under DISCUSSION.

7.4 *Plans for new Factory for Meat and Pilot Extract Plant*

Becausa of tha difficulties of exporting sanitary meat from the Medias plant, and because Medias is an ideal location for a meat plant, a new plant costing $3,500,000, on 4.1 hectares of land--of which $675,000 is new equipment--is layed out, costad and profitability calculatad in Sactions 8.3 and 8.4.

Tha ona-floor plant, with mezzanine, has 8,400 squara meters with an addtional 2,600 square matars of outlying buildings--such as pens, inedible rendaring, offica and maintenance. The new plant is designed for a 50 to 150 cattla a dey, 100 to 800 hogs a day, 5000 tons of conservas a yeer, 4000 tons of sausage a year, and 350 tons of Sibiu salami a year.

There are sufficient animals in this area for this rated capacity if the present Sibiu and Medias abattoirs are closed--as they should be--and the new plant is used for local carcass meat.

Because of the profit margin, this plant would pay for itself in about two years, without export considerations, and a zero profit for slaughtering. This pay-off period includes depreciation over 20 years, a ten percent interest on the investment, and assumes that the old plants be closed down, or completely rebuilt--which is not advisable. Due to the rapid pay-off, this plant should be attractive to outside investors, if needed.

7.5 *Soya Protein Usage*

Soya Protein flour, expeller made, is now being used at a level of 3.5 percent in sausage meat to enhance the binding and fat absorption of the product, and to improve the quality of the product. The flour is being mixed in the best known method for the type of soya, general condition, and type of sausage machinery available in most of the plants. Soya Concentrate is not available, except by importing.

7.6 *Overall Meat Plant Expansion Program and Training*

The more immediate plans of the food ministry is to have 11 modern facilities for slaughtering, canning, semi conserve processing, and sausage manufacturing. Most of the facilities will be capable of exporting a portion of the products assigned to them.

As in most countries, there is an oversupply of slaughtering and processing facilities; however, there is an undersupply of sanitary and "export approved" facilities.

Since there are only five million cattle and six million pigs, the raw material side of the meat industry needs to be expanded rapidly in order to increase exports and insure something more than 36 kilos per person, per year of local meat consumption. There is a strong world demand for the high-quality, sophisticated meats that Romania is able to produce, and should produce in greater quantities for the benefit of its people and peoples of the world.

8.0 DATA AND DRAWINGS

8.1 *Meat Industry in General*

Miscellaneous Agro-economic Data #9-1971

8.1.1 Animal Population		*Romania*	*Sibiu*
Bovine	Total	5,032,500	100,000
	Cows Only	2,175,000	
	Calves	339,800	
	Miscellaneous - Oxen		
	Water Buffalo	603,000	20,000
Pigs	Total	6,359,400	100,000
	Sows Only	681,800	
Sheep	Total	13,818,000	400,000
Goats	Total	536,000	
Foul	Total	54,000,000	

8.1.2 Price on Hoof		*18 Lei = $1.00 U.S.*
Bovine	150 - 220 Kg - alive	6.50 to 8.00 lei/K
Under Two Years	221 - 320 Kg	7.40 to 9.00
	321 - 400 Kg	7.80 to 9.30
	Over 400 Kg	8.30 to 9.80
	Milk Calves .50 lei bonus/K	
Adult		4.60 to 8.00
Pigs		
From Coops	90 - 100 Kg - alive	9.50 lei/Kg
	100 - 120 Kg - alive	10.50
	over 120 Kg	9.50
State Farm	90 - 100 Kg - alive	9.00 lei/Kg
	100 - 120 Kg	9.50

Source: Ministry of Food Production

8.1.3	Total Annual Meat Consumption		31.2 Kg per year per person
8.1.4	Total Annual Sausage Consumption		5.1 Kg per year per person
8.1.5	Average Age of Bovine Slaughtered		1.5 to 2 years or over 8 years
8.1.6	Average Number of Piglets Per Sow Per Year		15
8.1.7	Present and Planned Meat Plants Meat Conserves all for 3000 - 4000 tons per year except		Sibiu Medias Bucharest Suceava Galati Timisoara Turnu Severin Constanta
		Future	Craiova Botosani Vaslui
	Meat Salughtered in 15 Abattoirs in Future will be 25 - 30 Newest Plants		Hatag Turnu Severin Brasov

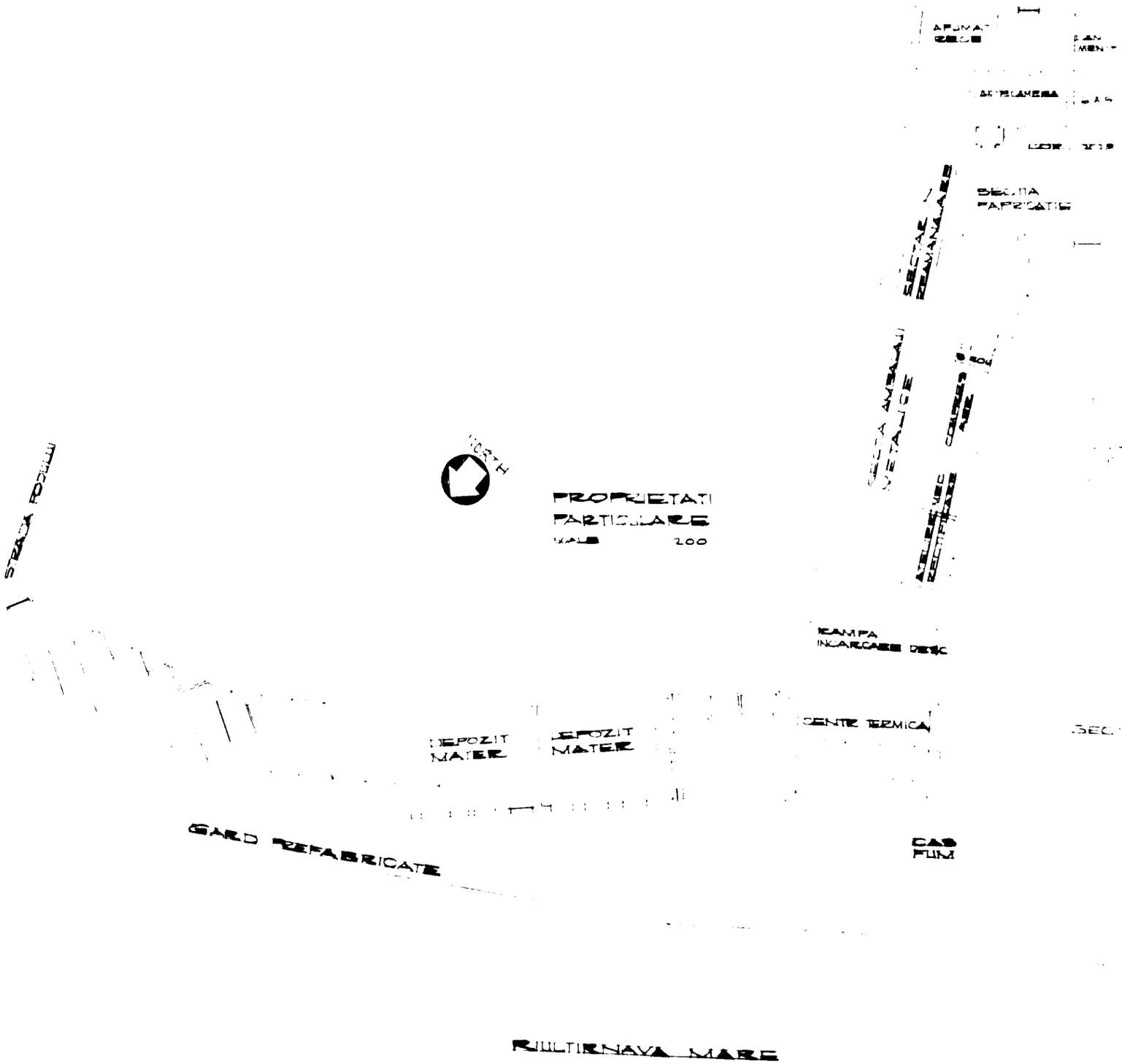
8.2 *Medias Present Plant - Data and Drawings*

Equipment Needed
to
Achieve Production Goals
Medias

4000 Tons Prepared Meat
5000 Tons Conserves Tinned
400 Tons Sibiu Salami

Item	Quantity	Description	Cost and F.O.B.	Cost and Installed	
		Sausage			
1	2	Meat Mixers - 200 Pounds	12,000	15,600	
2	1	Grinder with knives and plates 25 horsepower	6,200	8,000	
3	1	Silent Cutter 200 Pounds 50 horsepower	18,900	22,500	
4	1	Mincemaster - 50 horsepower	5,500	6,400	
5	2	Stuffers	11,000	14,500	
6	1	Ventilation for Smokehouse and New Door Seals	5,000	8,000	
					75,000
		Canning			
7	1	Konti Koch- 300 Kilos/HR	21,000	27,000	
8	1	Filling Machine-100-300 cans per minute	7,200	9,000	
9	2	Can Washing Lines - each 6000 cans per hour	14,200	18,000	
10		Miscellaneous	20,000	24,000	
		Can Making			
11		Repairs to present can body former		5,000	
					83,000
		No new can-making equipment. Move plant to Sibiu if new plant built - bring supplemental cans from Sibiu if do not move			158,000

* This expenditure does not improve buildings, but merely equipment for production goals - Plant will not pass most government inspections.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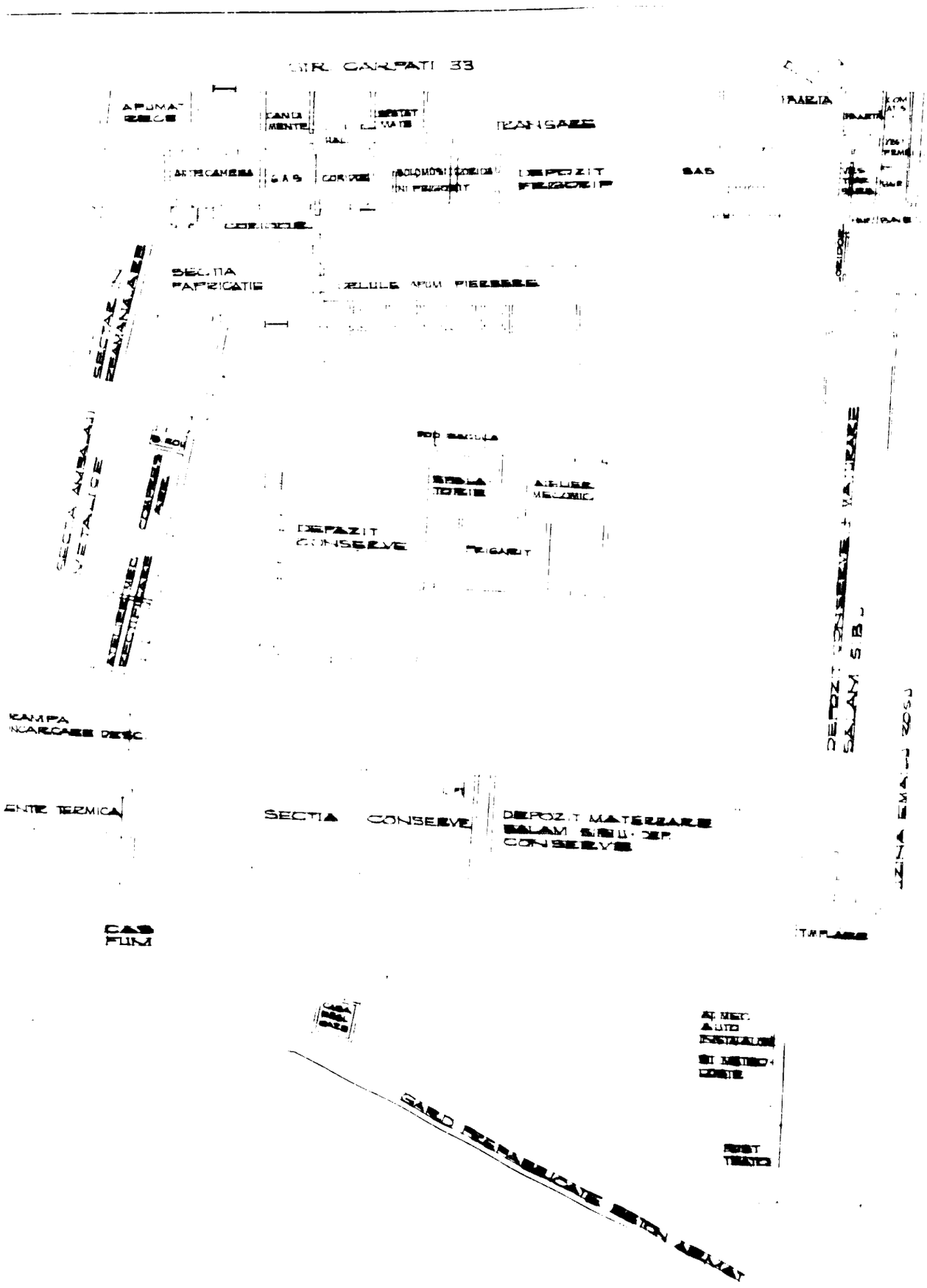
SECTION 1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CONSERVE
CAZANE FUM
GARD REPARATE BETON ARMAT

SECTION 2

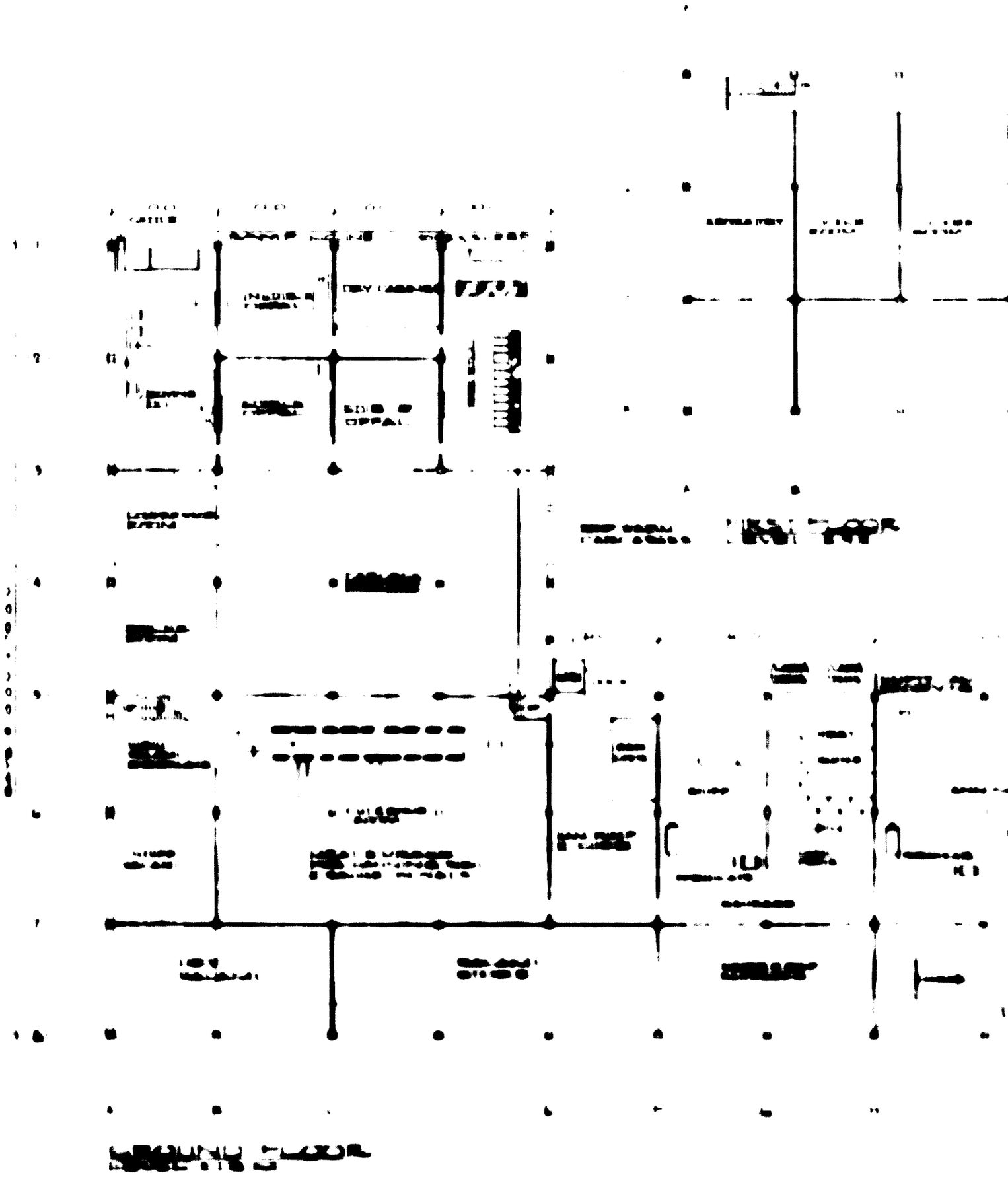
MEDIAS PRESENT PLANT
REJUVENIZATION
BUILDING

No.	Room Description	Foundation	Ceiling	Window	Floor	Walls	Plumbing	Lighting	Refrig.	Doors	Misc.	Total
1	Meat Receiving - Carcase	1500	500	600	500	1000	1700	500	2000	1000	-	9,300
2	Meat Cooler - Carcase	2000	1500		2000	3000	2000	1000	6000	2000	9000*	28,500
3	Ante Room Carcase & Lav.	2000	500	200	700	1500	1500	500	1000	1000		8,900
4	Meat Cutting & Boning	3500	3000	3000	3000	4600	2500	1500	3000	1500	3000	28,600
5	Compressor Room										8000**	8,000
6	Refrigeration Corridor	1000	500		200	500	200	200		500		3,100
7	Curing Cellar	8000	2000		4000	4000	3000	1000	2000	1500		25,500
8	Corridor	1000	500		1000	1000	1500	500	1000	500		7,000
9	Equipment Wash Room	500	500	500	1000	1500	2500	500				7,000
10	Spice Room	500	500	500	1000	1500	500	500				5,000
11	Smokehouse	1500	2000	2000	3500	4500	2000	2000				17,500
12	Antechamber	500	1000		2000	3000	1000	1000	1000	1500		11,000
13	Corridor		1000		2500	3000	1000	1000	1000	2000		11,500
14	Trim Room - Pump	2000	2000	2000	2000	3000	2500	1500	2000	500	2000*	19,500
15	Sausage Form & Stuff	1000	2000	3000	3000	4000	3000	1500	3000	2000	3000	25,500
16	Ham & Jowl Cook	1000	1500	3000	2500	2500	2000	1500		1000	2000***	16,000
17	Smokehouses			4000			3500			2000		9,500
18	Mechanical Shop & Compressor Room											
19	Cooler	2000	3000		3000	4000	2500	2000	6000	1000	8000*	31,500
20	Laundry											
21	Can Deposit							1000				1,000
22	Can Making											
23	Can Making & Storage											
24	Boiler Room											
25	Cooler & Head Preparation		3000		4000	4000	1000	1500	8000	2000	6000*	29,500
26	Cooking - Konti and vat		1000		4000	3000	4500	500		1000	2000***	16,000
27	Can Filling & Capping											
28	Can Cooking											
29	Can Storage						1500					1,500
30	Sibiu Storage		3000		4000	4000		1500			8000	20,500

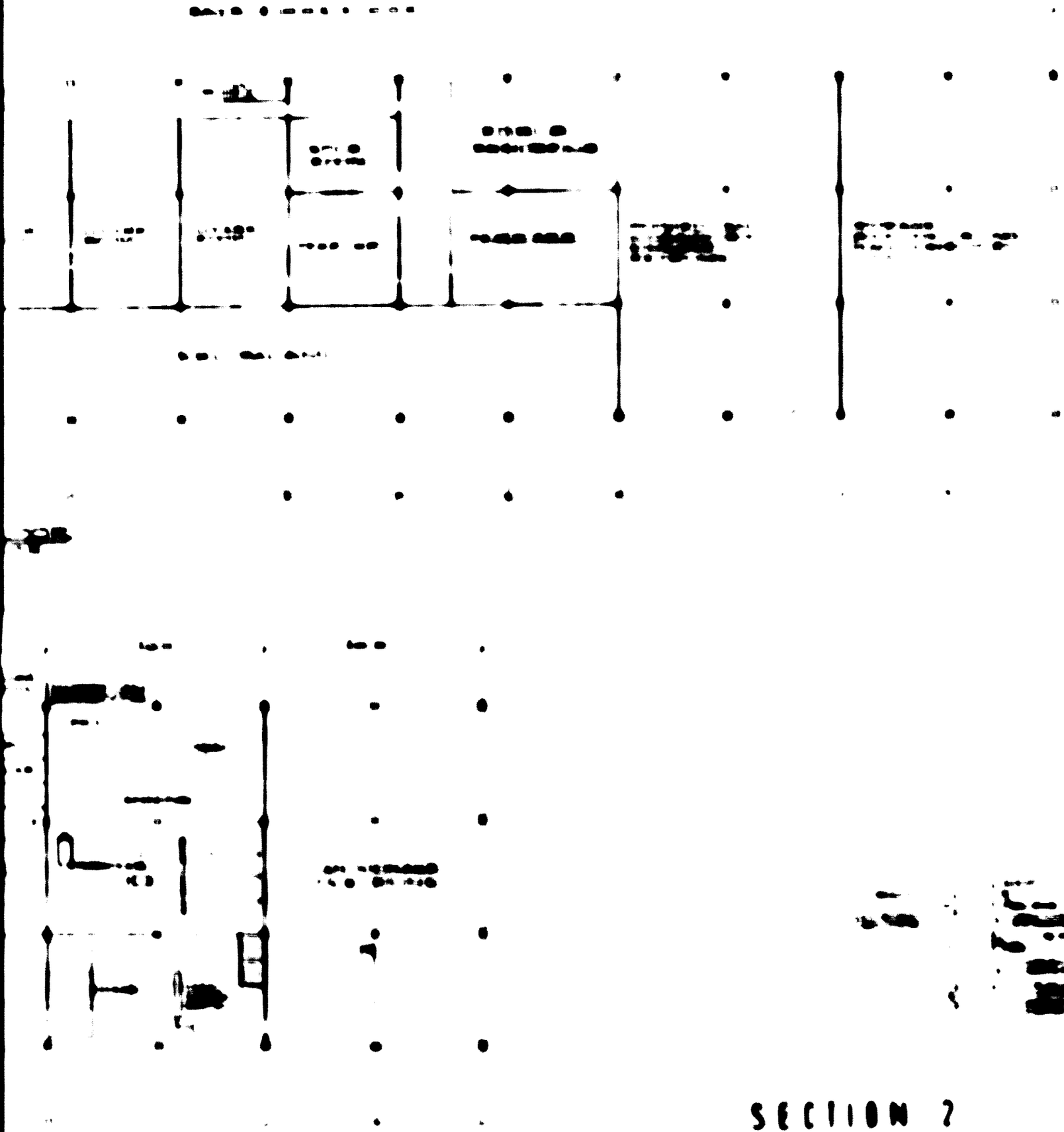
...1.1 (continued)

No	Room Description	Foundation	Ceiling	Window	Floor	Walls	Plumbing	Lighting	Refrig. Doors		Misc.	Total
31	Grounds										15000	15,000
32	Lavatory	2500	2000	1200	4000	4000	6000	2000		(Lockers)	12000	33,700
	Sub-Total											390,100
					SIBIU SALAMI PLANT							
1A	Raw Meat Storage & Pens (3 floors)	6000	3000	4000	4000	6000	4000	2000	6000	4000	8000*	47,000
2A	Pens and Stuff	2000	1500	3000	4000	2000	4500	1500		1500		20,000
3A	Smokehouse	4000	2000	3000	2000	6000	3000	2000		4000		26,000
4A	Storage Room	6000									8000	14,000
												107,000
												$497,100

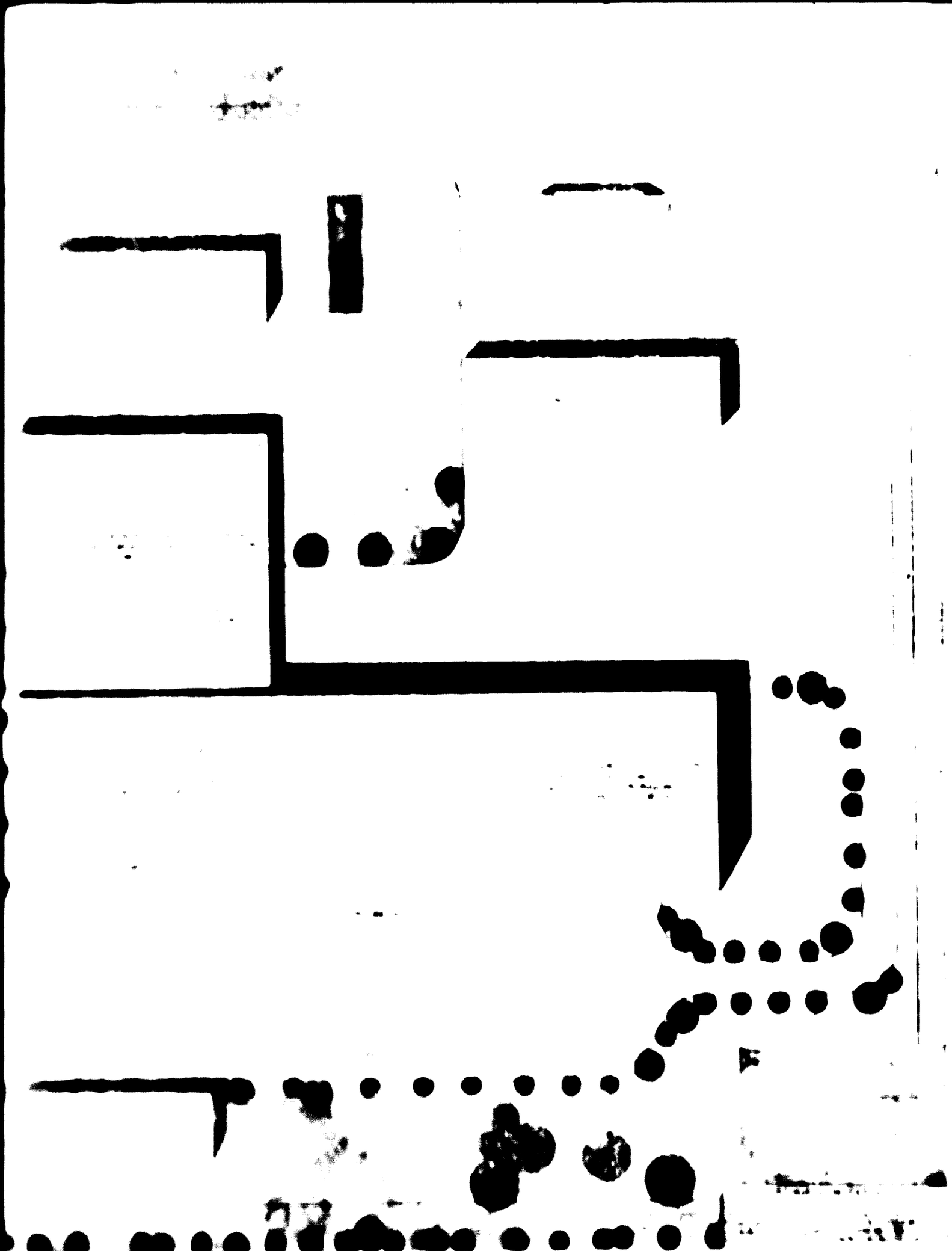
* Insulation
** Compressor
*** Ventilation



SECTION 1



SECTION 7



SECTION 2

8.4 *Mediaș Data - New Plant*

Capacities

Cattle	50 - 200 per day
Hogs	100 - 800 per day
Canning	5000 Tons per year
Sausage	5000 Tons per year
Sibiu Salami	400 Tons per year (1.5 Tons per day)
Carcass Cooler Capacity	300 Cattle plus offal 800 Hogs plus offal
Live Cattle Storage	500 Cattle
Live Hog Storage	1500 Pigs
Sibiu Salami Storage	400 Tons
Truck Washing	2 Units
Inedible Rendering	2 - 5 Kilo Cookers
Water Storage	2 Tanks
Sewage - Primary Settling and Skimming	

8.4.1

Summary of Costs
for
New Medias Meat Plant

Cost of Land - 4.1 Hectares ($5000 per Hectare)	$ 20,000
Cost of Site Improvement	36,000
Cost of Buildings	2,220,000
Cost of Equipment Installed	675,000
Total Cost	2,951,000
Contingencies	300,000
Start-Up Engineering	200,000
	3,451,000

8.4.2

New Plant Medias
Building Utilization and Cost
4.1 Hectares Land

Yearly	Daily
6000 Tons Prepared Meats	50 - 150 Bovine
5000 Tons Tinned Conserves	200 - 800 Hogs
400 Tons Sibiu Salami	

Item	Room Description	Sq. Meters	$ Sq. Meter	Total $ Cost	Old Plant Meters
	Ground Floor				
1	Bovine Slaughter/50-200 animals/day	200	250	50,000	
2	Inedible storage for processing	100	200	20,000	
3	Edible offal storage and processing of casing	300	200	60,000	
4	Hog Slaughter	200	250	50,000	
5	Coolers-800 Hogs - 300 cattle offal two days	600	300	180,000	250
6	Boiler and Engine Room	200	250	50,000	200
7	Sibiu Salami Formulate	100	250	25,000	50
8	Sibiu Salami - Stuff	100	250	25,000	150
9	Sibiu Salami - Dry & Smoke-2 Levels	200	250	50,000	200
10	Sibiu Salami Drip. .4 Tons per meter 320 tons	900	300	270,000	
11	Sausage Plant	400	250	100,000	160
12	Storage for Ham and Bacon and Pump.	200	300	60,000	
13	Canning Plant	600	250	150,000	440
14	Finished Can Storage-Two Levels	1200	100	120,000	900
15	Shipping and Finished Product Storage	300	250		100
16	Cutting/Boning Meat Storage	600	300	180,000	150
	First Floor				
17	Casing, Drying and Processing	200	250	50,000	
18	Laboratory	200	250	50,000	
19	Dressing Rooms - Male and Female - 500 Employees	500	250	125,000	
20	Laundry	100	100	10,000	
21	Freezer	180	300	54,000	
22	Edible Rendering	180	250	54,000	
23	Spice Room	100	200	20,000	
24	Halls	150	250	37,500	
25	Dry Can Storage and Washing	600	100	60,000	300

8.4.2 (continued)

Item	Room Description	Sq. Meters	$ Sq. Meter	Total $ Cost	Old Plant Meters
	Other Buildings				
26	Scale House	150	100	15,000	
27	Office Canteen	300	200	60,000	
28	Inedible Rendering and Sanitary Slaughterhouse	350	150	52,500	
29	Cattle Storage and Pens	770	100	77,000	
30	Hog Storage and Pens - 1000 Animals	770	100	77,000	
31	Mechanical	300	100	30,000	
	Total			$2,162,000	

Summary
Equipment List
New Plant Medias

4.1 Hectares Property

4000 Tons Prepared Meats 5000 Tons Tinned Conserves 400 Tons Sibiu Salami
50 - 100 Bovina and 200 - 800 Hogs per day

Item	Operation Description	F.O.B.	Installed
1	Beef Kill	29,500	34,700
2	Hog Kill	27,500	32,000
3	Edible Offal	7,000	8,000
4	Inadible Offal and Casing Storage	22,700	26,900
5	Sibiu Salami	26,300	30,550
6	Cooler	15,100	18,300
7	Boiler and Engine Room	83,000	95,000
8	Cutting Room	49,500	57,700
9	Sausage Plant	107,200	123,700
10	Canning Plant	27,000	32,200
11	Can Storage - Full and Empty	7,800	8,800
12	Shipping Dock	2,000	2,000
13	Laboratory	12,000	13,000
14	Dressing Rooms	6,600	7,600
15	Edible Rendering	12,500	15,200
16	Freezer		
17	Offica Cantean	7,500	8,500
18	Scala House and Yard	6,600	8,600
19	Cattle and Hog Storage Pens	Building Costs	
20	Inedible Rendering, Sanitary Slaughter-house and incinerator	73,200	89,200
21	Mechanical Department & Truck Wash	7,500	8,600
22	Ham and Bacon Processing	18,500	19,900
23	Spice Room	1,000	1,200
24	Laundry	4,200	5,300
25	Reinstalling Present Equipment		25,100
			$671,850

8.4.4

Detailed
Equipment List
New Medias Plant

Item	Quantity	Description	Price $ F.O.B.	Sub Total F.O.B.	Price to Install
		Hog Kill			
A1	1	Conveyor Platforms, Electric Stunning Hoist Washer	7,500		
A2	1	Moving Viscera Table Sterlizing	8,900		
A3	1	Skin Puller, Saw for Splitting, Ten Air Knives	6,900		
A4	1000	Trolleys	4,200	27,500	4,500
		Beef Kill			
B1	1	Conveyor Platforms , 3 Lifts	6,500		
B2	1	Hoist Lander, Knocking Pen, Stunning Pistol, Small Hoist	6,200		
B3	1	Hide Puller, Breastbone splitter, Carcass Saw	8,600		
B4	400	Beef Trolleys, SS Hooks	1,600		
B5	1	Viscera Truck, Tablehead, Work-up Sterilizing Lav.	6,550	29,500	5,200
		Doors And Scales			
C1	3	Yard Scales	6,600		
C2	5	Rail Scales	8,500		
C3	4	Table Scales	4,100		
C4	3	Cooler Doors-1 Freezer door	2,800	22,000	3,200
		Refrigeration			
D1	1	Compressor, 1 Booster Condenser and controls-60 ton refrigeration	35,000		
D2	1	Evaporator units and controls	27,000		
D3	1	300 hp. boiler with condensate return and/or water treatment	21,000	83,000	12,000
		Inedible Holding and Salting			
E1	1	Skin Salter	6,500		
E2	1	Beef and Hog Casing Cleaning System	14,000		
E3		Casing Cleaning Tables	2,200	22,700	4,300

9.4.4 (continued)

Item	Quantity	Description	Price $ F.O.B.	Sub Total F.O.B.	Price to Install
		Edible Offal			
F1	2	Scalder Scraper	4,500		
F2	1	Head Work-up	1,000		
F3	20	Trees	1,500	7,000	1,000
		Cooler and Freezer			
G1		Rail System -700 Meters	2,100	2,100	2,100
		Sibiu Salami			
H1		Cutting Stuffing	Transfer		
H2		Miscellaneous Truck Sticks	5,500		2,000
H3	1	Improve Packing Table	2,500		
H4	1	Cold Smokehouse conditioner and smoker	14,000		
H5	1	Lift Elevator	4,250	26,250	4,300
		Cutting Room			
I1		Saw Main Table with bone conveyors	21,000		
I2		Side Tables	3,000		
I3		Pickle injector/vat tray trucks	25,500	49,500	8,200
		Sausage Plant			
J1	1	Silent Cutter Mince Master	16,400		
J2	2	Stuffers and Tables	8,200		
J3	2	Mixers	8,800		
J4	1	Grinder	4,150		
J5	4	Smokehouses with controls and smoke makers	48,000		
J6		Rails	1,000		
J7	1	Jordan Cookers, Coolers	6,650		
J8		Cold Smoke Equipment	14,000	107,200	16,500
		Canning Plant			
K1		Mixer, emulsifier, Grinder, Peeling Closer, Autoclaves & Retorts, Rental Cooker	Transfer		
K2	2	Can Washers	7,800		
K3		Rental Cooker	12,500		
K4		Boiler	6,700	27,000	5,200

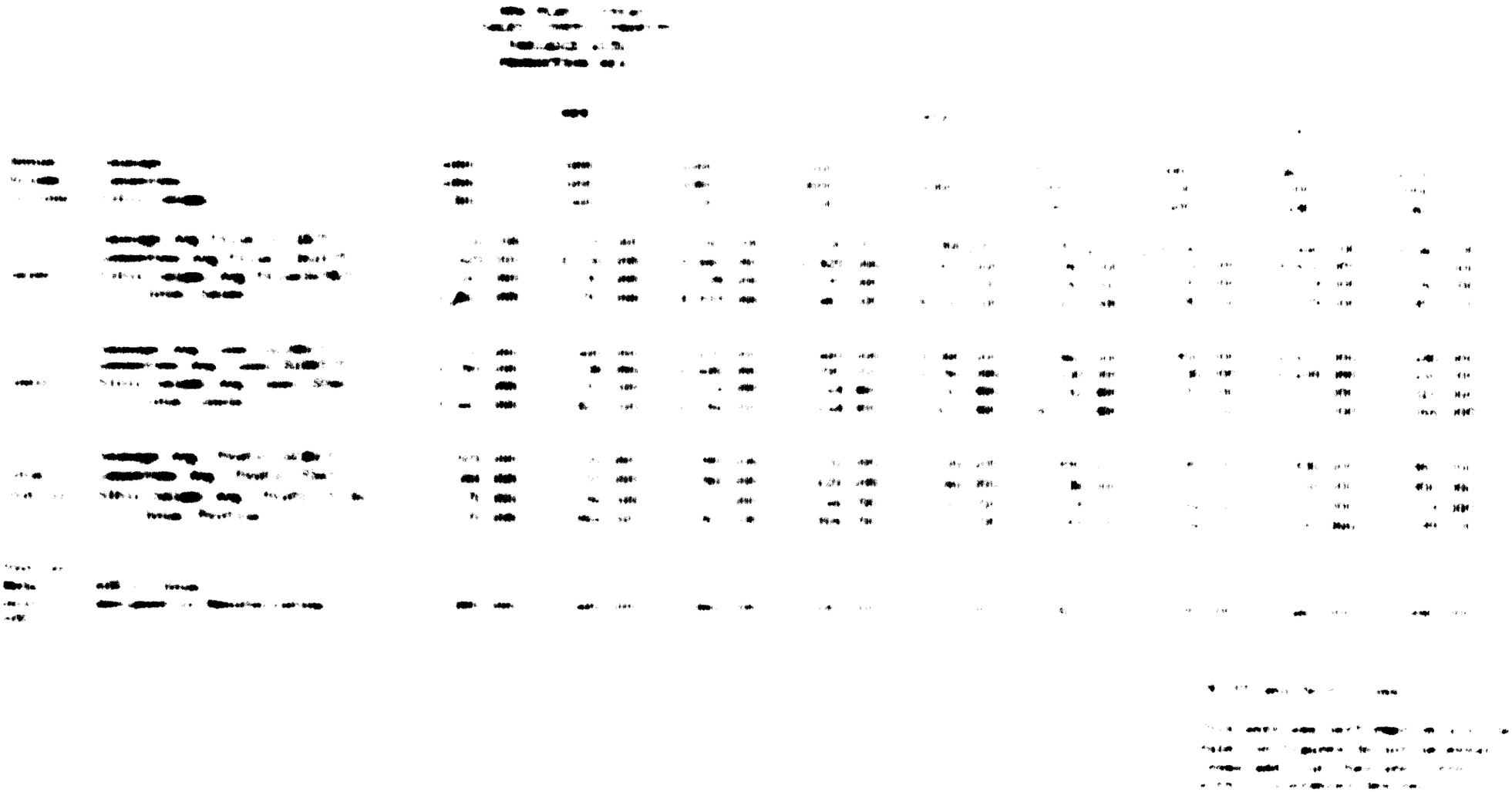
8.4.4 (continued)

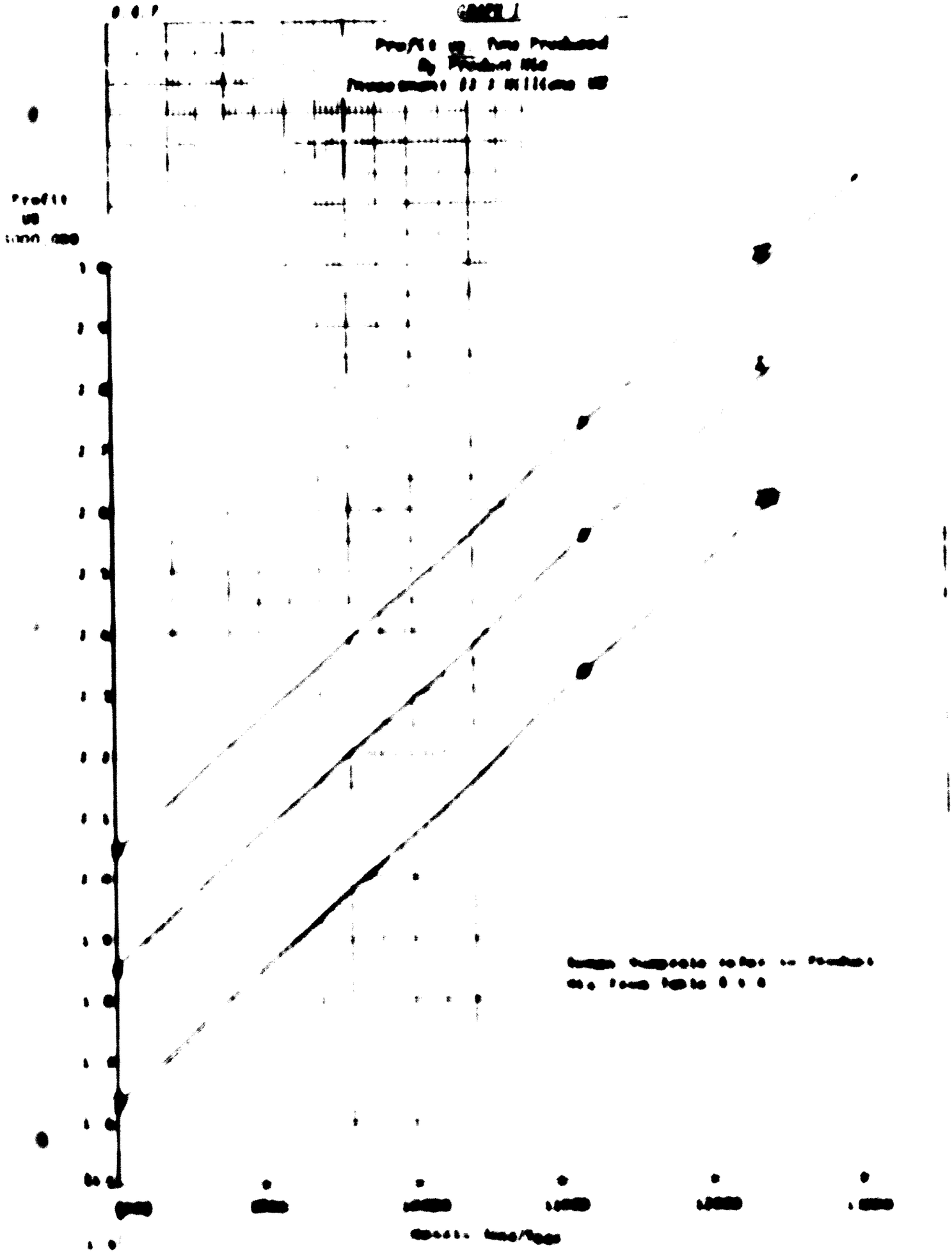
Item	Quantity	Description	Price * F.O.B.	Sub Total F.O.B.	Price to Install
		Edible Rendering			
L1	2	10,000 Pound lard tanks and grinder Pump	12,500	12,500	2,700
		Inedible Rendering			
M1	1	Blow System and Grinder	12,600		
M2	2	Cooker - 5x12 and Crax Pan	24,200		
M3	1	Centrifuge	15,000		
M4	1	Mill	4,000		
M5		Sanitary Slaughterhouse and incinerator	8,200		
M6		Blood Storage, Bagger, Crax storage and grease tank	9,200	73,200	16,000
		Laundry Equipment			
N1			4,200	4,200	1,100
		Transportation in Plant			
O1		Fork-lift truck with battery charger	7,800	7,800	1,000

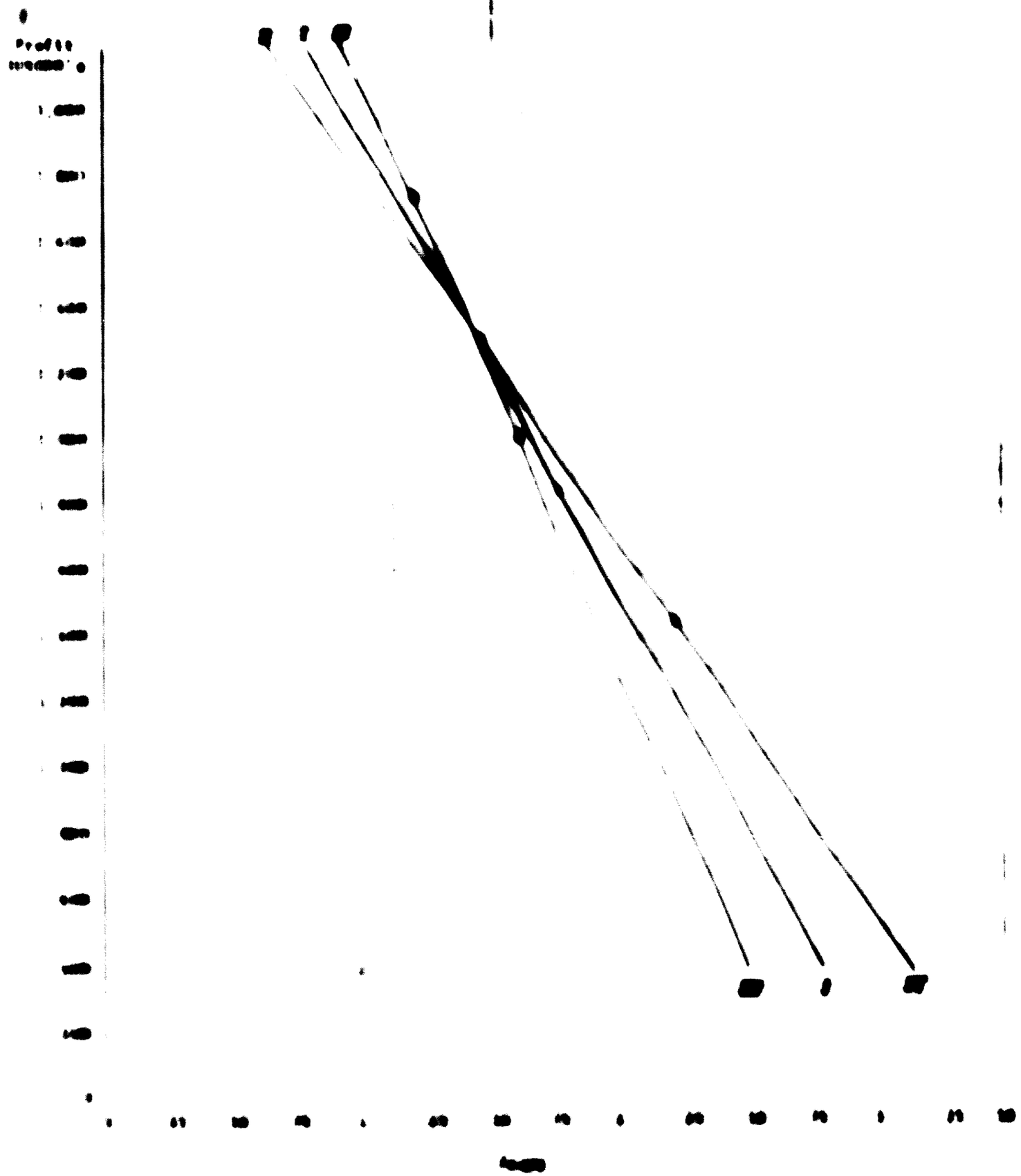
P.4.5

Usable Equipment
From Present Medias Plant
In New Installation

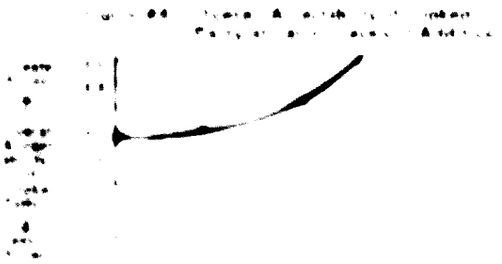
Item	Quantity	Description	Value in Place	Cost to Reinstall	
		Sibiu Salami Plant			
1	1	Stuffing Line	25,000	1,500	
2	1	Silent Cutter - 200 Pounds	20,000	1,100	
3	1	Compressor Ammonia - 40 hp.	10,000	800	1,600
		Canning Department			
4	4	Autoclaves and Controls	40,000	1,200	
5	1	Kontl Cooker	18,000	2,500	
6	2	Vertical Retorts	6,000	1,200	
7	1	Dosing Line	10,000	600	
8	3	Cappers	10,000	1,200	
9	1	Meat Pump	2,000	200	1,100
10	1	Meat Mill	6,000	200	
		Can Making-Move to Sibiu			
11	1	Can Former - Body	25,000	6,500	
12	1	Can Former Line - Tops	15,000	2,100	
13	2	Sitters	2,000	1,000	2,000
		Miscellaneous			
14		Lift Truck	2,000		
15		Compressor	10,000		
16		Laundry Equipment	6,000	3,000	1,000
			$260,000		$29,100







soy protein fact sheet



APPENDIX ACTION BY: Regional Offices and State Agencies

Textured Vegetable Protein Products (B-1) to be Used in Combination with Meat for Use in Lunches and Suppers Served Under Child Feeding Programs

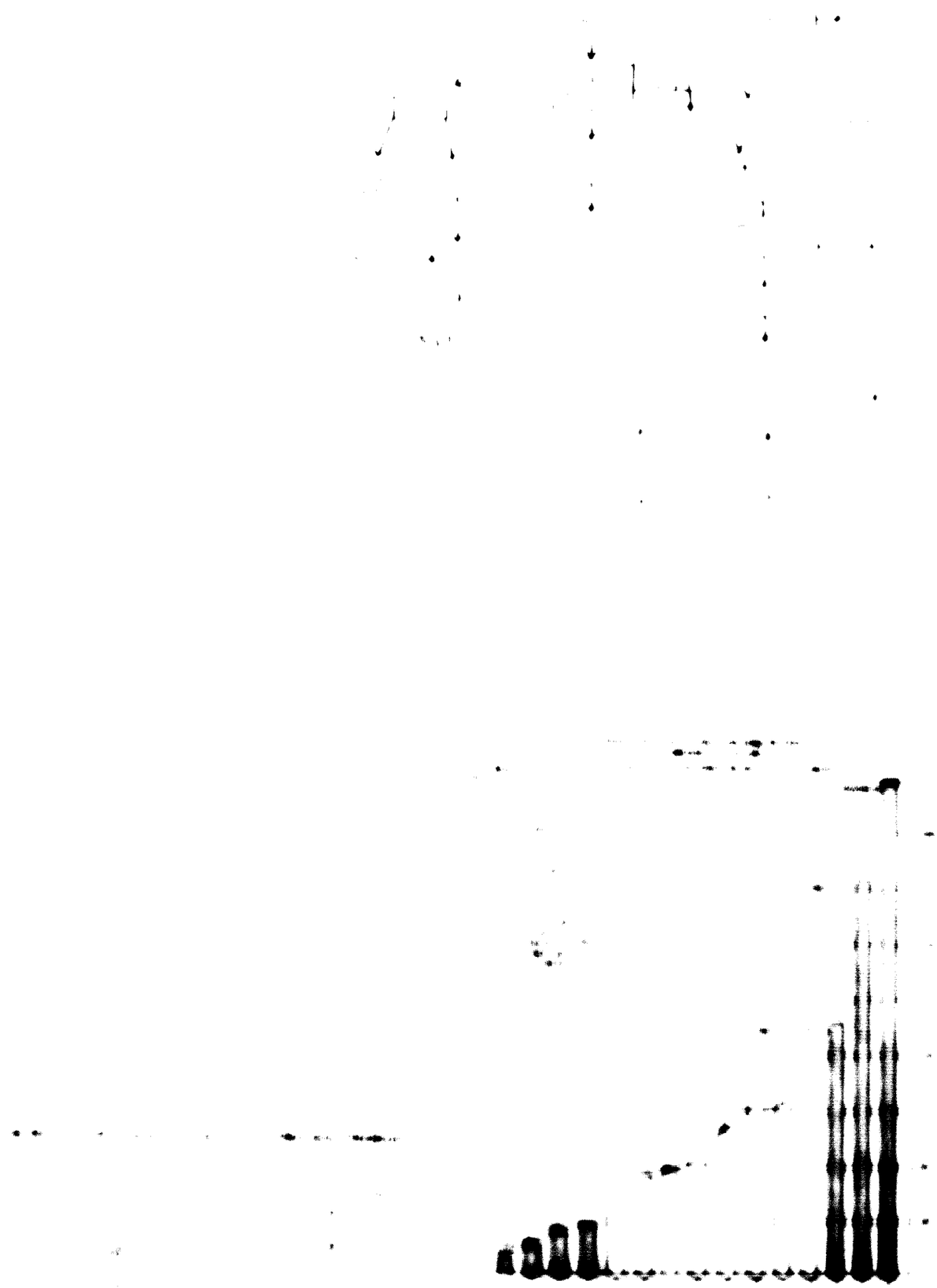
[illegible]

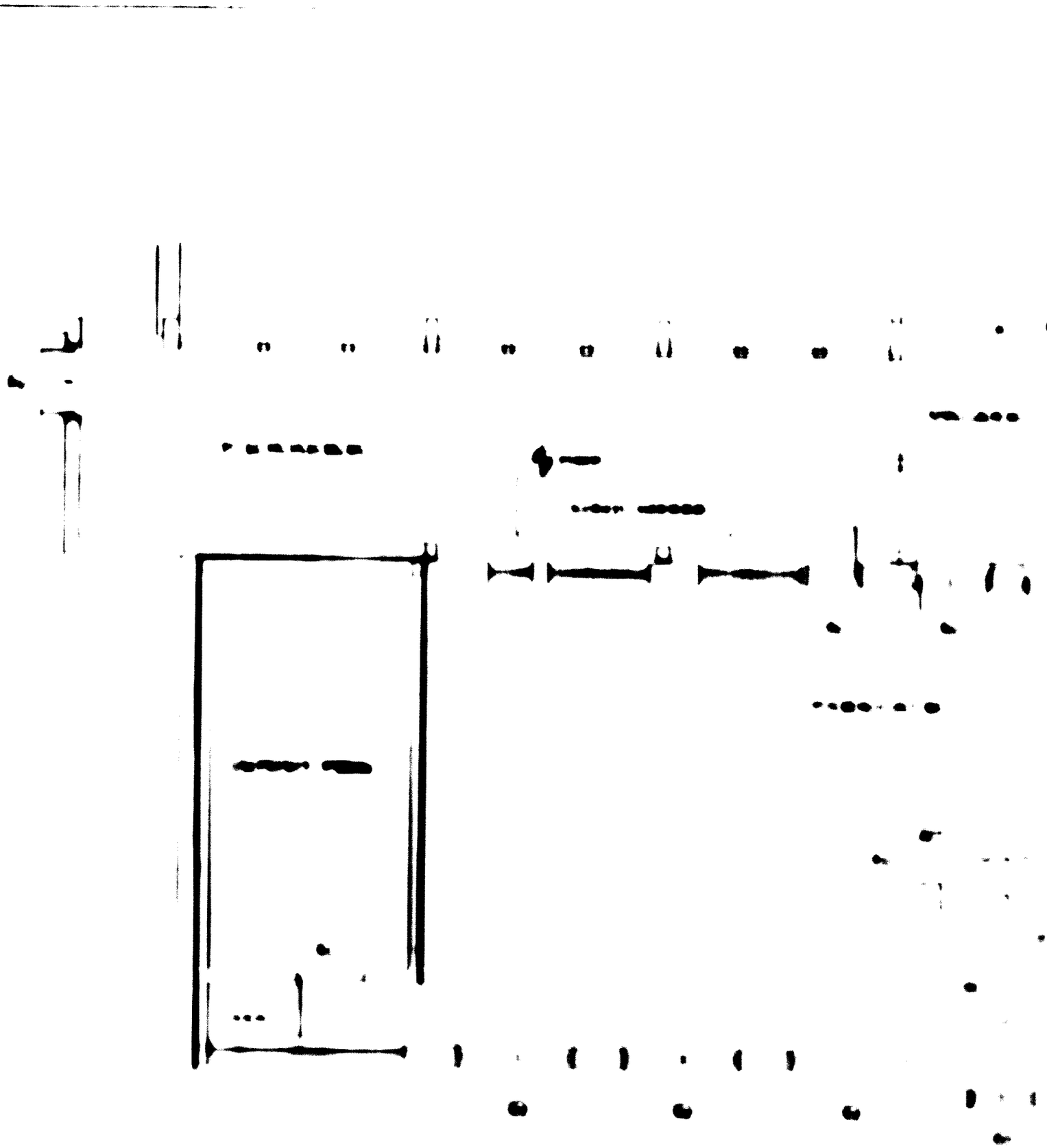
[illegible]

[illegible]

[illegible]

[illegible]





SECTION 2

[illegible] Data Pilot Retrofit Plant

[illegible]

Cost of Equipment F.O.B.	Imported	[illegible]
Cost of Equipment	Domestic	[illegible]
Cost of Freight		[illegible]
Cost of Installation		[illegible]
		[illegible]

[illegible] Yield

Produces [illegible] Tons canned beef per year
or
[illegible] Tons per hour

Produces [illegible] Tons canned per year [illegible]
or
8 Tons per hour

Produces [illegible] Yield [illegible] Tons per hour
or
48 Tons per year
(800 Cattle Head Required)

Product Value [illegible] per Ton [illegible]

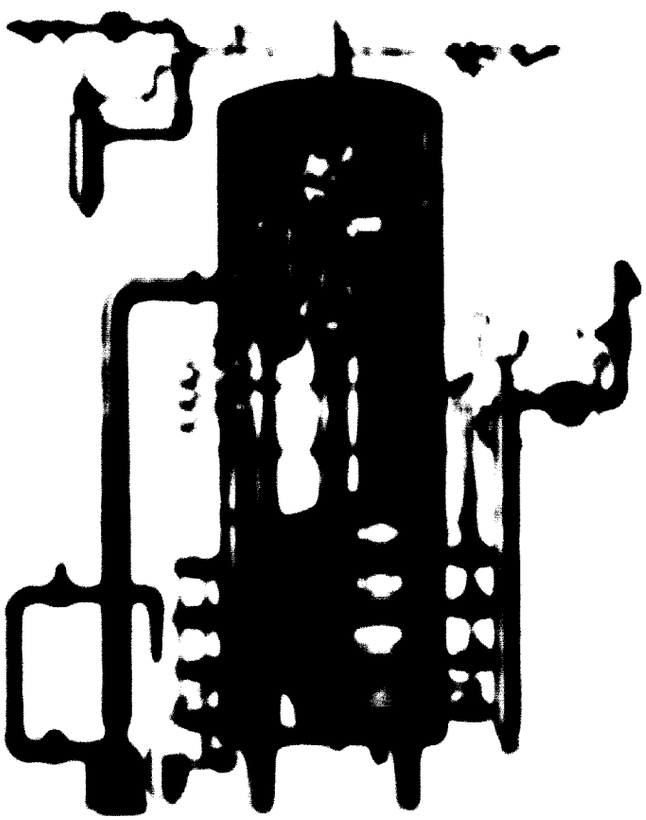
Plant Gross Return [illegible] per year

Plant Gross Per Unit [illegible] [illegible]
[illegible]

* Can Double Return by Using Both Steam Pump Systems
* Steam, Electrical, Gas Operated and Other Power Investigations
Recommendations are significant here

[redacted]

Molecular Vacuum Pump



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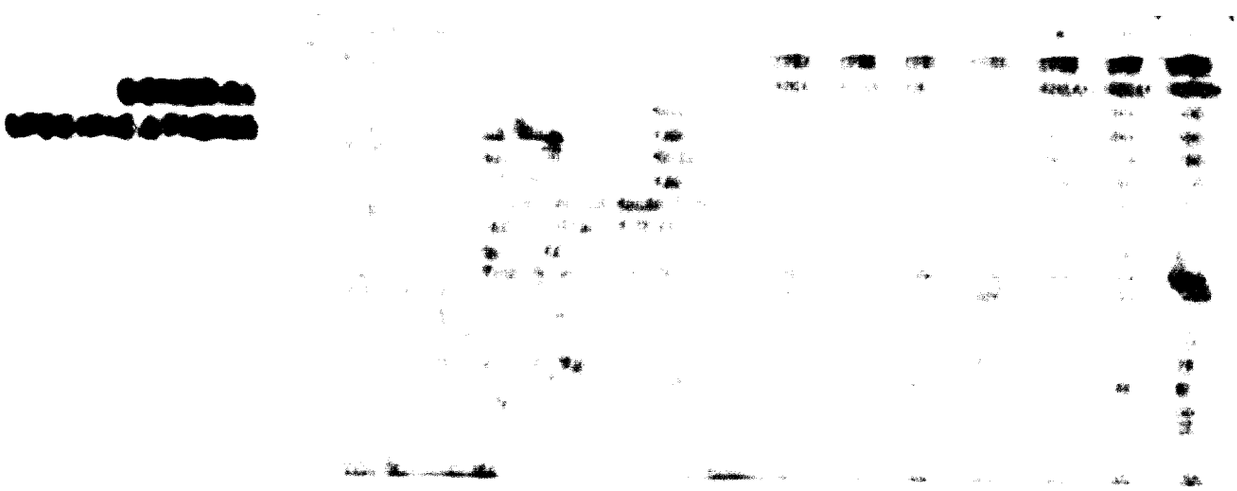
VACUUM PANS

[redacted]

[redacted]

[redacted]



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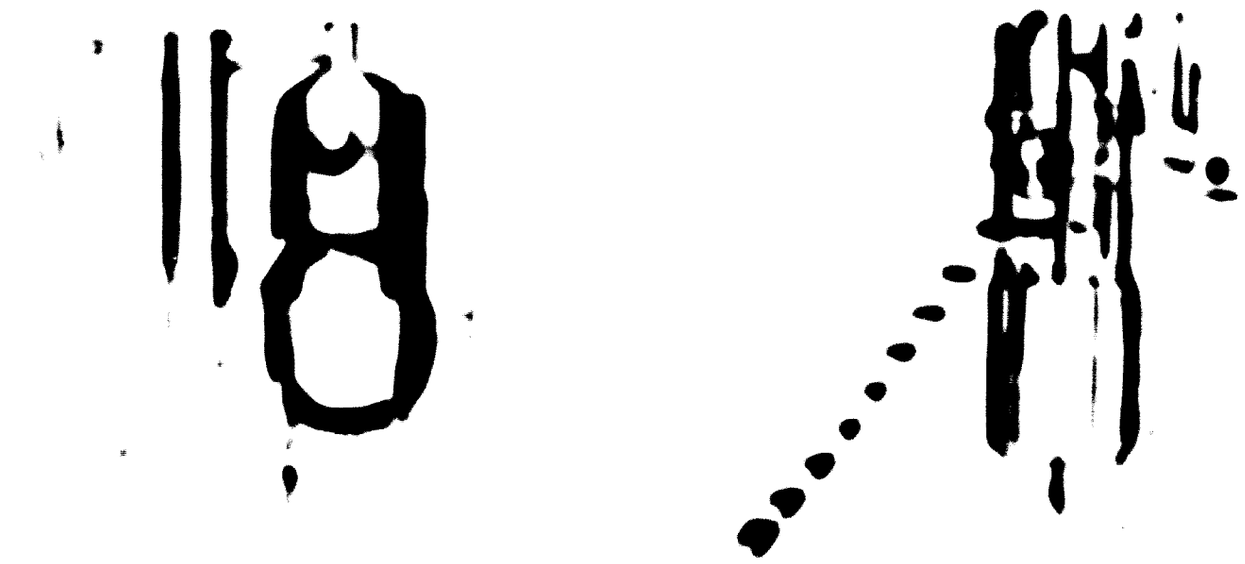
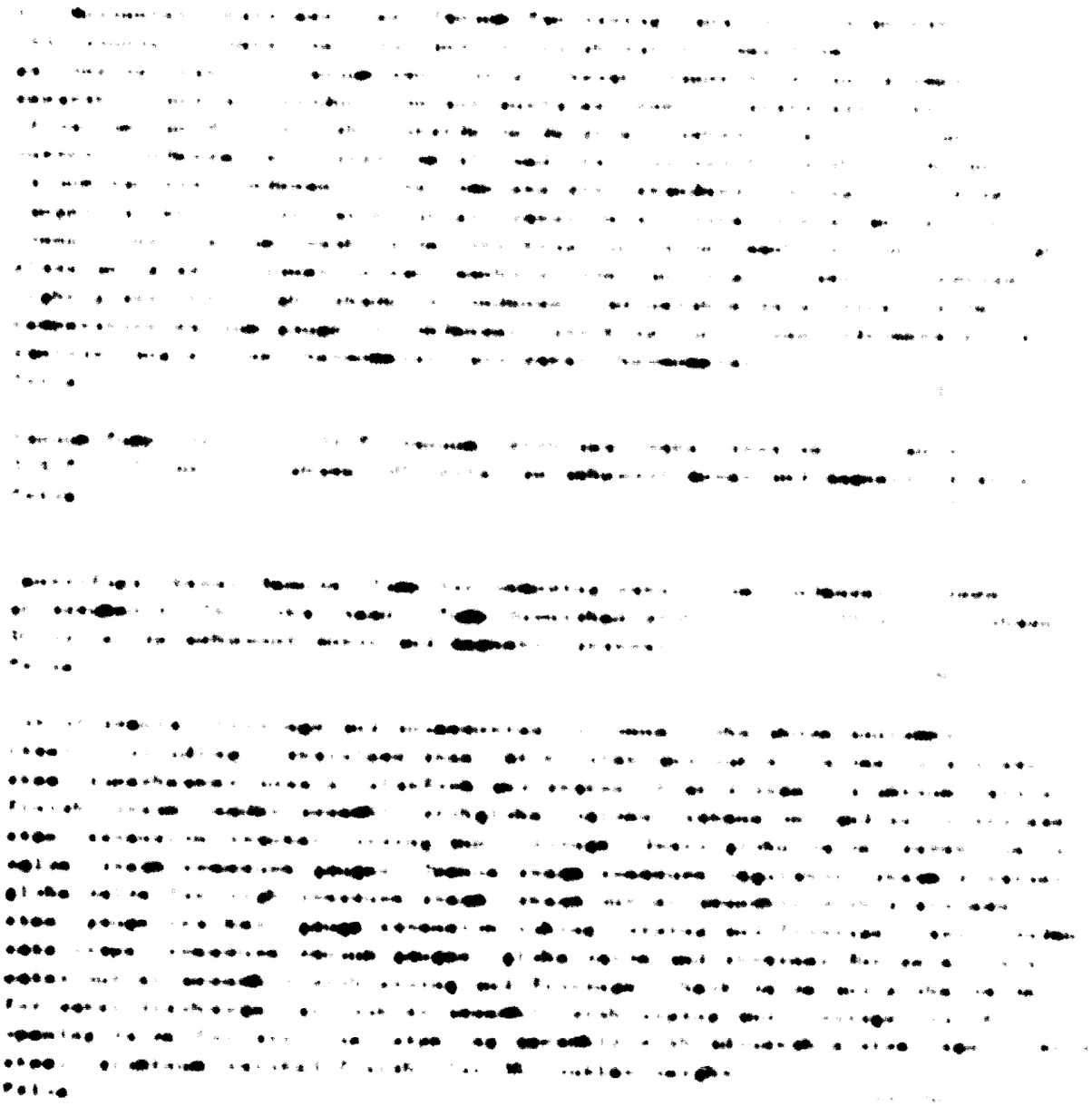
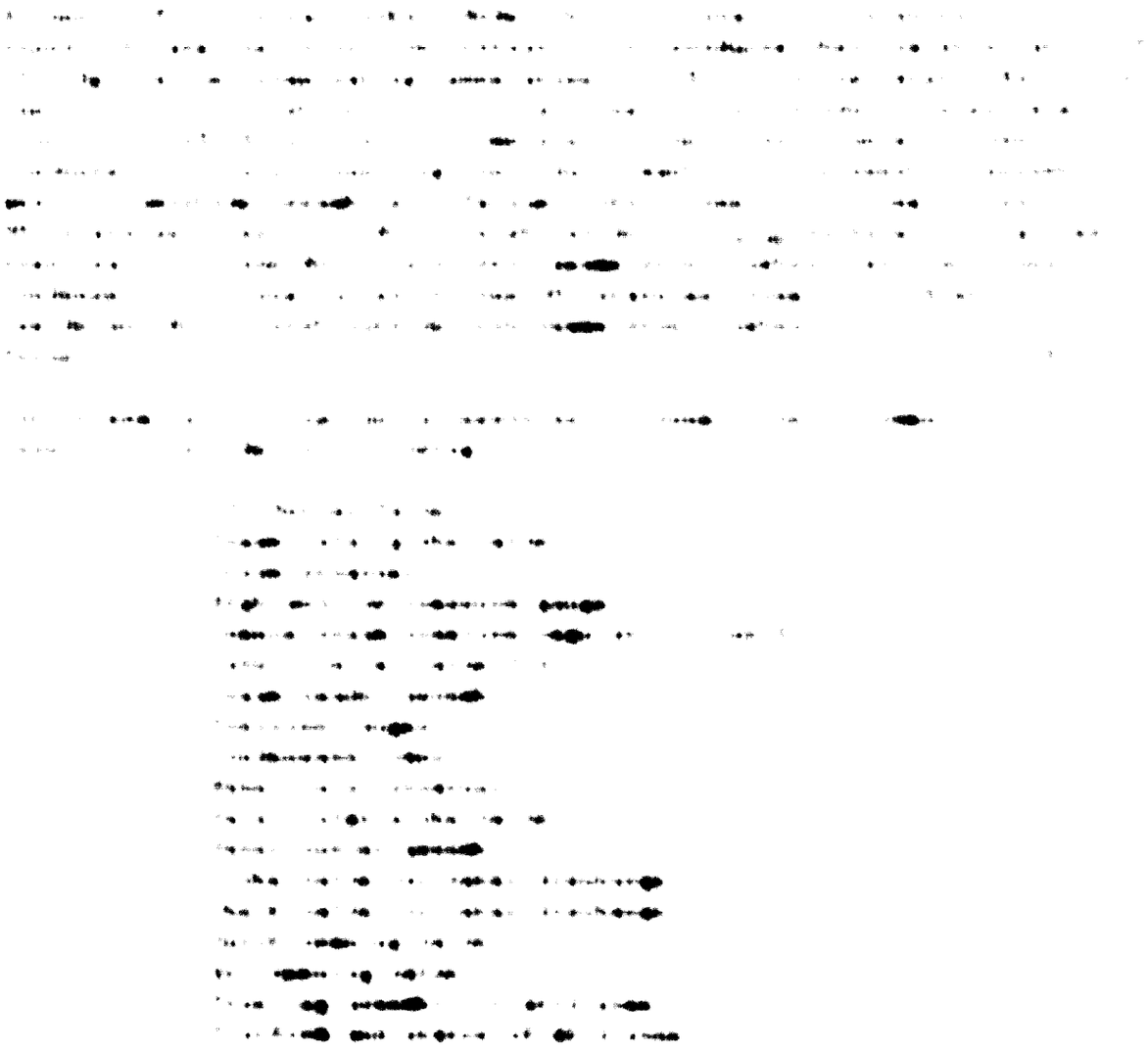
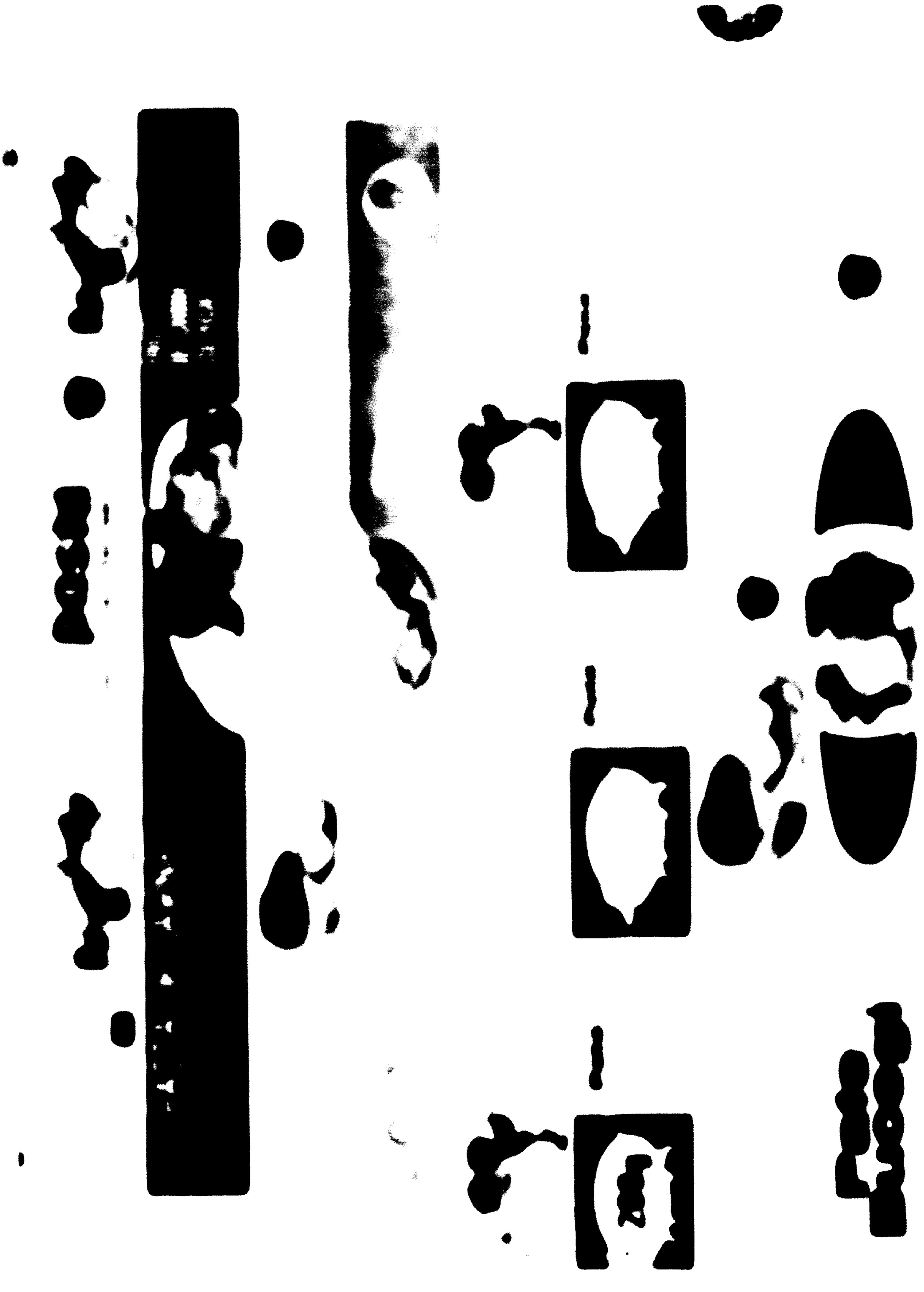


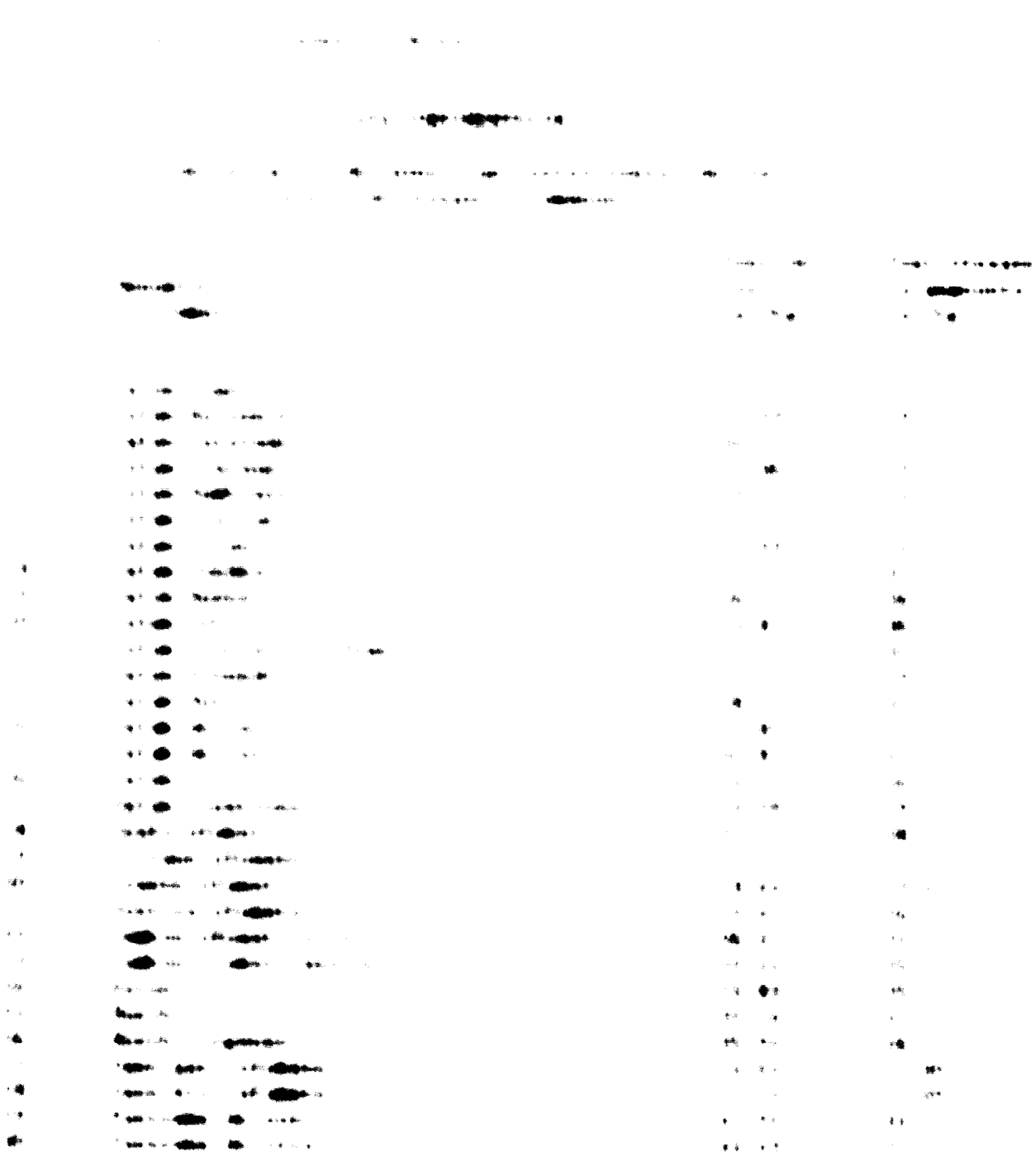


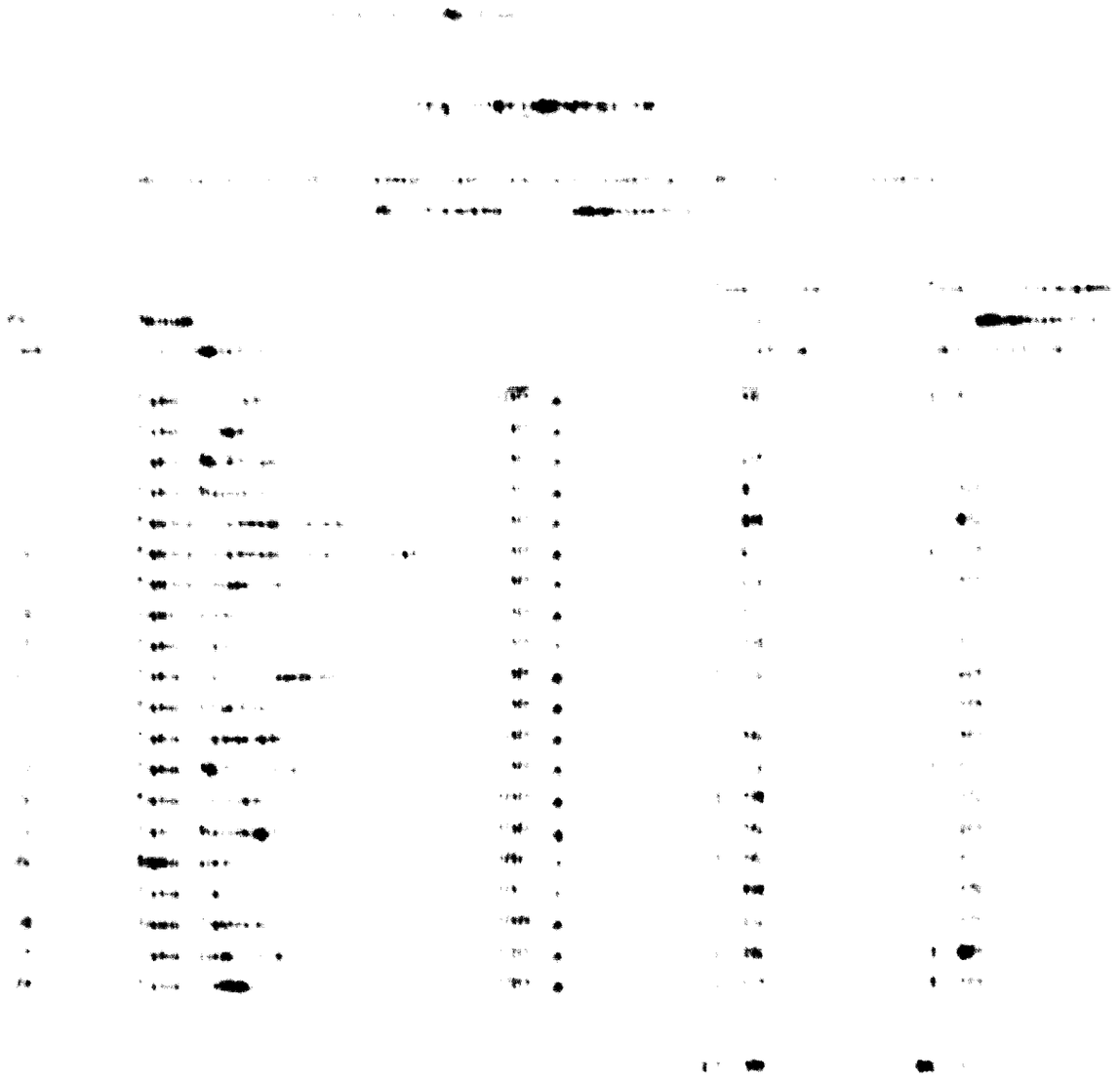


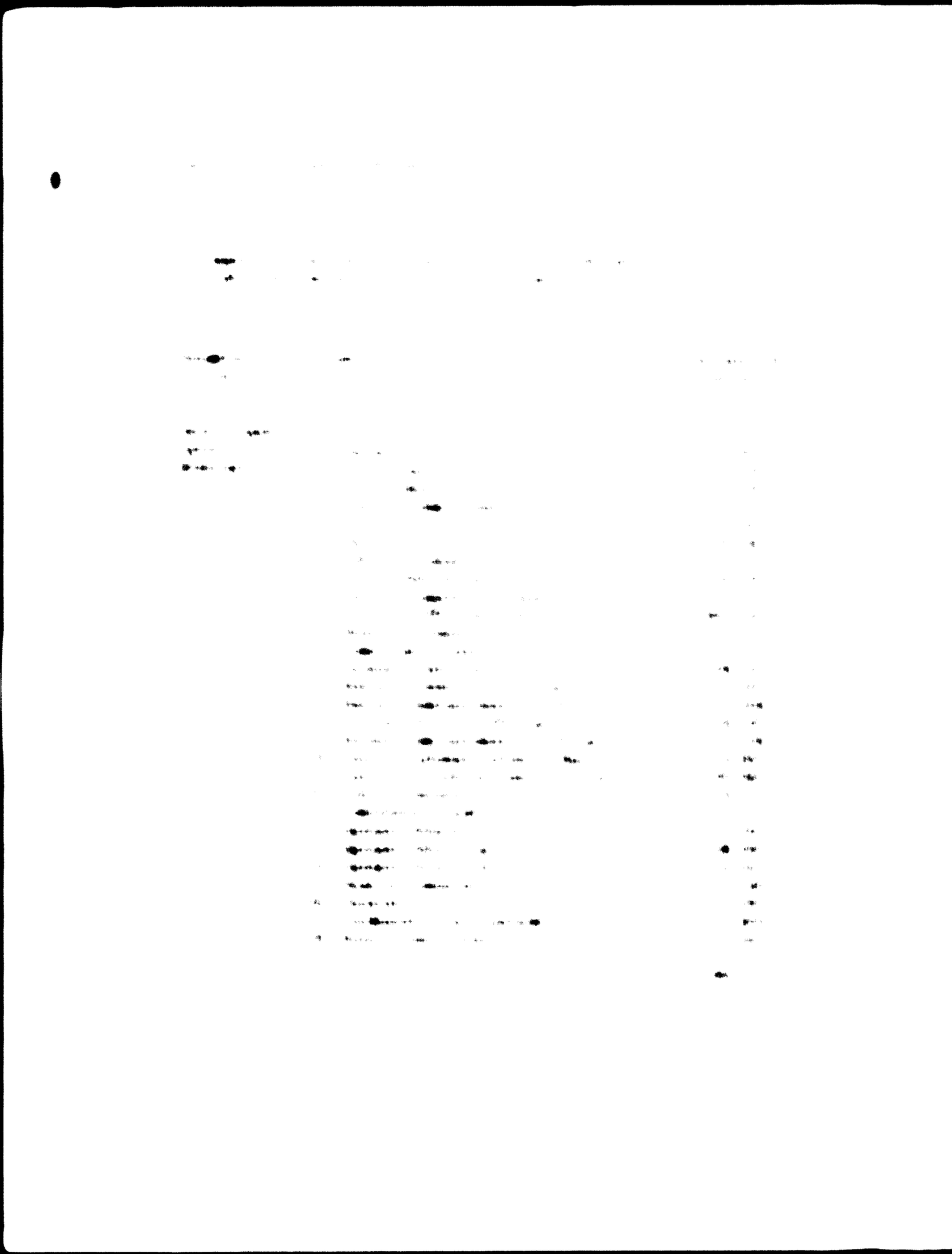
BAT CAPTAIN
HATE THIS...


SCALES









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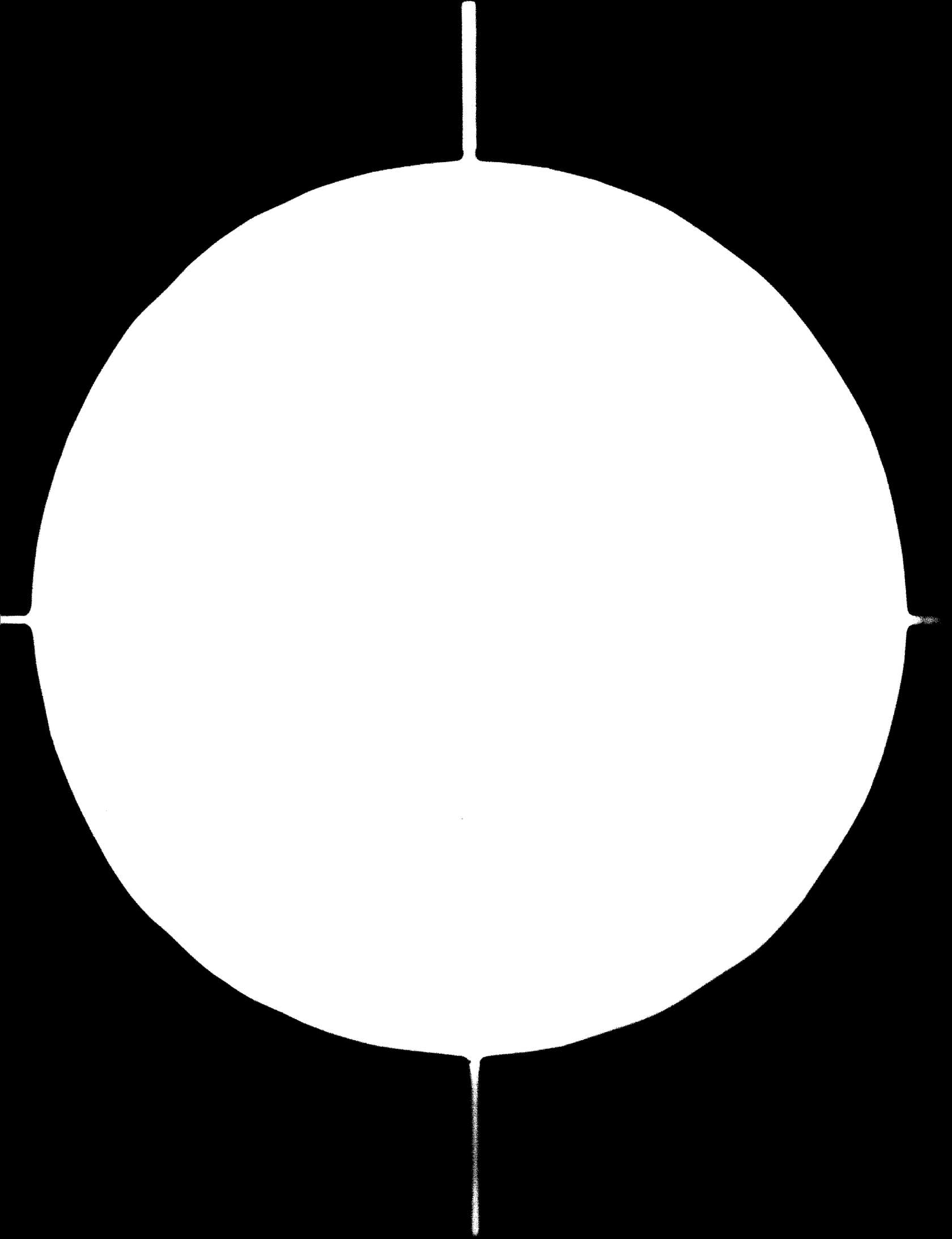
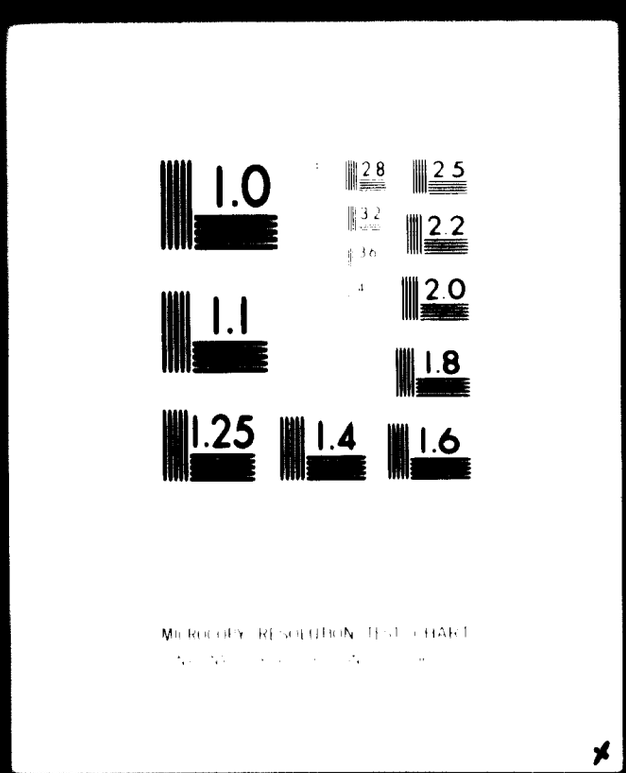




3.8 *(continued)*

	Denumirea sectiei		Denumirea utilajului	Valorea de inventar
C.	SECTIA SALAM SIBIU	1.	Linia Kramer Grebe	1.637.903.-
		2.	Fierastrou Mkiorotor	5.402.-
		3.	Tocila	5.210.-
		4.	Masina Wolf	10.100.-
		5.	Masina taiat slanina cuburi	21.100.-
		6.	Masina Cutter Alexanderwerk	153.000.-
		7.	Banda legat salam Sibiu	71.268.-
		8.	Masina tocat Technofrig	26.400.-
		9.	Masina condimente	9.450.-
		10.	Moara condimente	.700.-
		11.	Asecensor materiale	165.400.-
		12.	Bascula pod o.20.000 kg.	28.600.-
		13.	Balanta P. 500 kg. 2 buc.	17.800.-
		14.	Balanta semiautomata cu dadran aeriana .P. 500 kg.	8.930.-
		15.	Balanta semiautomata cu dadran P. 20 kg.	2.616.-
		16.	Balanta semiautomata P. 100 kg.	3.850.-
		17.	Mese metalice scurgere	17.200.-
		18.	Mese metalice zvintare	78.296.-
		19.	Elevator linie	16.900.-
		20.	Termohigrografe 10. buc.	12.897.-
		21.	Rastele	24.857.-
		22.	Agregat frig 20,000 Kcal/h	38,000.-
		23.	Agregat frig 40,000 Kcal/h	91.000.-
		24.	Instalatie frigorifica	151.456.-
		25.	Separator racire	21.944.-
		26.	Schimbatoare caldura	17.600.-
		27.	Electroventilator	1.240.-
		28.	Carucior platforma 10. buc.	20.746.-
		29.	Carucior transport meseluri 25 buc.	91.437.-
		30.	Grand 200 l. 20 buc.	53.880.-
		31.	Grand 500 l. 20 buc.	71.000.-
		32.	Bazin 500 l. 10 buc.	35.500.-
				2.912.062.-

RECAPITULATIE

Sectia fabricatie	2.684.077.-
Sectia conserve	4.440.991.-
Sectia salam Sibiu	2.912.062.-
Sub Total Lei	10.037.130.-

9.5 (continued)

Se adauga: Mijloace de transport aparate de laborator birouri si instal. de lucru.-	5.686.870.-
TOTAL GENERAL:	15.724.000.-

SALCOMSERV - MEDIAS

Salam de vara
Calcul la 1 Kg produs finit

Pozitia	Articole de Calculatie	Consum specific pe unitat a de produs	Pret	Cheltuieli pe unitatea de produs lei
50	Raw Material-Beef First Quality	0.735	26.42	19.46
12	Pork	0.250	19.83	4.96
33	Lard	0.485	16.85	8.17
	Total Raw Materials	1.470		32.59
140	Pepper	0.0020	51.00	0.10
240	Soya	0.0035	4.15	0.01
200	Garlic	0.0029	18.75	0.05
116	String	0.0012	47.40	0.08
	Casing	0.34	1.12	0.38
	Casing	0.58	1.60	0.93
	Total Auxiliary Material			1.55
	Total Raw and Auxiliary Material			34.14
	Transport and Procurement			0.85
	Direct Labor			0.50
	Manufacturing Overhead			0.90
	General Overhead			0.48
	Total Cost			36.87
	Profit			4.27
	Seller's Price			41.14
	Profit to store			2.86
	Sales Price to Final Consumer			44.00

SPECIAL PRODUCTS

Suggested Processing Instructions

TEXGRAN – BEEF PATTIES

FORMULA:

Canner And Cutter Chuck	35 Lbs.
Flank	50 Lbs.
(Texgran	4 Lbs.
(Water	11 Lbs.
TOTAL	100 Lbs.

Add Spice If Required

PROCEDURE:

Generally, when Texgran is to be added to ground meat formulas, it should be hydrated and ground with the rough cuts of meat.

The recommended level (starting point) of Texgran (Code No. 10000, 10100 or 10900) in beef patties is 4% dry weight. This is hydrated with 275% cold water (2.75 x 4 = 11 pounds water). Hydrate Texgran (4 pounds) and water (11 pounds) for 15-20 minutes (mixing periodically). Then add Texgran and any excess water to rough cuts and grind through a 1/2" die, mix for 1–3 minutes and grind through a 1/8" die and patty out.

The water in Texgran can be varied from 200% to 300% depending on desired product.

The Texgran level can be increased to a maximum of 8% if some meat base flavor is added to compensate for the dilution of the natural meat flavor.

SPECIAL PRODUCTS

Suggested Processing Instructions

CANNED CHILI WITH BEANS

This is a generalized formula and procedure for producing a canned Chili with Beans containing Texgran brand Textured Soy Flour.

FORMULA:

Water	39.00%
Red Chili Beans, cooked	28.00%
Beef, raw	25.00%
Seasonings & Flavorings, Salt & Sugar	3.25%
Starch	2.00%
TEXGRAN brand Textured Soy Flour*	1.50%
Flour, wheat or potato	1.25%
Total	100.00%

* – Most often used Texgran code No. 52000, which is listed in the ingredient statement as "Textured Soy Flour – Caramel Color Added". Alternates, such as code No. 10000 or No. 70000, are listed only "Textured Soy Flour".

PROCEDURE:

1. Blanch beans to a yield of 200%.
2. Blend Texgran and salt with meat and grind to desired size.
3. Pre-blend starch and flour and a cold water slurry.
4. Add seasonings to pre-heated mixer water.
5. Add meat mix and blend slurry into mixer.
6. Heat to set starch and pump to filler.
7. Retort process canned product according to N.C.A. recommendations.

SPECIAL PRODUCTS

Suggested Processing Instructions

SLOPPY JOE WITH TEXGRAN

This is a generalized formula and procedure for producing a canned or frozen Sloppy Joe containing TEXGRAN Brand Textured Soy Flour.

FORMULA:

Beef, Raw	40.00%
Water	37.00%
Onion	8.45%
Salt, Sugar, Seasoning	5.50%
Starch	3.00%
Tomato Powder	2.50%
TEXGRAN Code No. 52000	2.50%
NFDMS	1.00%
Coloring	.05%
Total	100.00%

PROCEDURE:

1. Blend TEXGRAN and salt with meat – grind to desired size.
2. Pre-blend starch and flour as a cold water slurry.
3. Add seasoning to pre-heated mixer water.
4. Add meat mix and blend slurry into mixer.
5. Heat to set starch and pump to filler.
6. Retort canned product according to N.C.A. recommendations.

SPECIAL PRODUCTS

Suggested Processing Instructions

SPANISH RICE

FORMULA:	Grams
Florasynth Smoked Ham Powder No. 256	12.0
Super BE	22.0
Sucrose	16.0
Citric Acid	4.0
Flaked Onions (Griffith)	28.0
Dried Green Pepper	20.0
Fine Black Pepper	0.36
Garlic Powder	0.2
Texgran (Ham Flavored)	96.0
(optional – can use colored unflavored)	
Spreda Powder	2 tsp.
Rice (Instant or Minute)	200.0
Florasynth Imitation Red Tomato Flavor	¼ tsp.

PROCEDURE:

Combine all ingredients together. Add 2 – 2½ cups of water to contents of package in an electric frypan or saucepan. Bring to a low simmer with occasional stirring. Simmer for 5 minutes or to desired consistency. Add water if needed. Add 4 tablespoons of tomato catsup before serving. Serve hot.

SPECIAL PRODUCTS

Suggested Processing Instructions

CHICKEN A LA KING

FORMULA:	Grams
Florasynth Chicken Flavor CF-1	12.5
Corral Chicken Powder	12.5
Onion Flakes (Griffith)	4.0
Instant Plus	20.0
Sexton Chicken Base	11.0
Hard Wheat Flour	10.0
Non Fat Dry Milk Solids	50.0
Sucrose	8.0
Texgran (10300)	40.0
Dried Mushrooms	6.0
Dried Green Pepper	3.0
Dried Red Pepper	3.0
Flavoring: 17.5 gms Corral Chicken Flavoring (Paste) 17.5 gms Water 5.0 gms CF-1 (Mix together)	17.5
Rice (Instant or Minute)	70.0

PROCEDURE:

Take 35 grams of flavoring (Corral Paste, water, CF-1) and pour over 40 grams of Texgran. Mix. Dry in oven. Combine all ingredients together except rice.

Cooking Instructions:

SAUCE – Combine 2½ cups of cold water with sauce and mix in a saucepan. Bring to boil while stirring. Simmer for 5 minutes. Add water as needed.

RICE – In a saucepan bring 1 cup of water to a boil. Stir in the rice. Cover and remove from fire. Let stand for 5 minutes. Serve sauce over hot rice. Yield: 2 servings.

UNITED STATES DEPARTMENT OF AGRICULTURE
CONSUMER AND MARKETING SERVICE
WASHINGTON, D.C. 20250

May 13, 1969

Mr. David V. Le Clair
Swift Chemical Company
1211 West 22nd Street
Oak Brook, Illinois 60521

Dear Mr. Le Clair:

Textured soy flour with and without coloring and flavoring is an accepted ingredient in numerous meat food products. However, as this is not an expected ingredient in many products of a meat food character, the Federal Meat Inspection Program requires special labeling to direct attention to its presence.

At present, the percent of textured soy flour permitted without special labeling statement is conducted on an ad hoc basis. Usually levels not in excess of three percent are accepted in most products without label declaration except in the ingredient statement.

As information becomes available on levels of use in various meat food products, we will advise. We are very sorry for the delay.

Sincerely,

Richard H. Almeyer
Head, Standards Group
Labels, Standards and Packaging
Branch
Technical Services Division

PORK SAUSAGE FOR PATTIES OR BULK

NAME: BREAKFAST PATTIES OR PORK PATTIES

INGREDIENTS:

LEAN PORK TRIMMINGS
REGULAR PORK TRIMMINGS
UNCLE BEMIS PURE PORK SAUSAGE SEASONING
SWIFT'S FOOD PROTEIN (S.F.P.)
CHOPPED OR SHAVED ICE
WATER

PROCEDURE:

1. WEIGH OUT 6 LBS. OF S.F.P. INTO CONTAINER.
2. ADD 4 ONE LB. BAGS OF SPICE TO DRY S.F.P., BLEND WELL BY HAND.
3. ADD 9 LBS. OF CHILLED (35 TO 40°) WATER TO S.F.P. AND SPICE MIXTURE.
4. ALLOW THE ABOVE TO SET WHILE YOU WEIGH OUT PORK TRIMMINGS.
5. WEIGH OUT 100 LBS. OF REGULAR AND 100 LBS. OF LEAN PORK TRIMMINGS.
6. GRIND THROUGH 3/8" PLATE ADDING SHAVED ICE AS GRINDING PROCESS CONTINUES. (USE 10 LBS. OF ICE PER 200 LBS. BATCH).
7. AS GRINDING PROCESS CONTINUES, SPRINKLE S.F.P. AND SPICE MIX THROUGHOUT MEAT.
8. MIX 2.5 TO 3.5 MINUTES.
9. GRIND THROUGH 1/8" PLATE.
10. HOLLYMATIC THROUGH 8 S PLATE FOR SAUSAGE PATTY.

FORMULATION FOR FONDWURST (BRATWURST) WITH S.F.P.

INGREDIENTS:

50 LBS. PORK (BOSTON BUTTS)
4 LBS. S.F.P.
17 LBS. WATER
1½ LBS. SALT
1 OZ. BLACK PEPPER
1 OZ. MACE

PROCEDURE:

1. WEIGH OUT 4 LBS. OF S.F.P. INTO CONTAINER AND ADD 12 LBS. OF CHILLED (35 TO 40°) WATER.
2. WEIGH OUT 5 LBS. OF CHILLED WATER INTO SEPARATE CONTAINER AND ADD 1½ LBS. OF SALT, 1 OZ. BLACK PEPPER AND 1 OZ. OF MACE. STIR SLIGHTLY UNTIL SALT HAS DISSOLVED.
3. ALLOW THE S.F.P. AND WATER (1) AND WATER AND SALT MIXTURE (2) TO SET FOR 10 TO 15 MINUTES.
4. WEIGH OUT 50 LBS. OF PORK AND PUT ON GRINDER HOPPER.
5. ADD WATER AND SALT MIXTURE TO S.F.P. CONTAINER AND MIX SLIGHTLY BY HAND.
6. SPREAD S.F.P. MIXTURE OVER ROUGH CUTS AND GRIND THROUGH 3/8" PLATE.
7. GRIND INTO MIXER OR TRANSFER TO MIXER AND MIX FOR 1.5 TO 2.5 MINUTES.
8. STUFF MATERIAL INTO NATURAL CASING AND REFRIGERATE.

NOTE: ALTERNATIVE FOR STEP (5)

INSTEAD OF ADDING WATER AND SALT MIXTURE TO S.F.P., POUR IT VERY SLOWLY INTO MIXING PROCESS AND MIX 2 TO 3 MINUTES.

LOAVES - PICKLE AND PIMIENTO

30 LBS. BEEF TRIMMINGS
50 LBS. REGULAR PORK TRIMMINGS
10 LBS. BEEF PLATES
10 LBS. PARTIALLY DEFATTED PORK FATTY TISSUE
10 LBS. SWEET PICKLES
10 LBS. PIMIENTOS OR RED PEPPERS
3½ LBS. SALT
12 LBS. SWIFT'S FOOD PROTEIN (S.F.P.)
5 LBS. FRESH ONIONS
8 OZ. GROUND WHITE PEPPER
1 OZ. MARJORAM, GROUND
1 OZ. FRESH GARLIC
50 LBS. SHAVED ICE
7/8 OZ. SODIUM ASCORBATE
1/4 OZ. NITRITE
3/4 OZ. NITRATE

CHOP BEEF AND ONIONS TOGETHER, AND PORK SEPARATELY, THROUGH 1/8 INCH PLATE. CUT PICKLES IN 1/4 INCH PIECES, PIMIENTOS IN 1/2 INCH PIECES. CHOP GARLIC FINE AND MIX WITH CURE. PLACE BEEF, SALT AND CURE IN SILENT CUTTER. CUT FOR 1/2 MINUTE, ADD SHAVED ICE AND S.F.P. A LITTLE AT A TIME UNTIL ALL THE S.F.P. HAS BEEN USED. THEN ADD PORK AND SEASONING, AND CHOP SO THAT THE EMULSION IS OF THE SAME CONSISTENCY AS FOR BOLOGNA. PUT MIXTURE INTO MIXER. ADD PICKLES AND PIMENTOS. MIX WELL.

COOK, STUFF AND MOLD UNDER YOUR INDIVIDUAL CONDITIONS.

FRANKFURTER - BOLOGNA TYPE

15 LBS. BONELESS CHUCK
5 LBS. VEAL TRIMMINGS
15 LBS. BEEF PLATES
55 LBS. REGULAR PORK TRIMMINGS
10 LBS. SPECIAL LEAN PORK TRIMMINGS
4½ LBS. SWIFT'S FOOD PROTEIN (S.F.P.)
30 LBS. SHAVED ICE — 25 LBS. PER BOLOGNA
3 LBS. SALT
7 OZ. PEPPER
2 OZ. MACE
3 OZ. GROUND MUSTARD
1 OZ. ONION POWDER
1/4 OZ. GARLIC POWDER
CURE

FINISHED PRODUCT WEIGHT WILL DEPEND UPON THE CONDITION OF THE MEATS AND THE AMOUNT OF MOISTURE ADDED.

A POINT TO REMEMBER IN USING S.F.P. IS ITS ABILITY TO BIND FAT AS WELL AS MOISTURE. THIS ABILITY REDUCES GREASING OUT AND CERTAINLY IMPROVES YIELDS.

POLISH STYLE SAUSAGE

30 LBS.	BONELESS CHUCK	}
20 LBS.	PORK CHEEKS	}
20 LBS.	LEAN PORK TRIMMINGS	} CURED
20 LBS.	REGULAR PORK TRIMMINGS	}
10 LBS.	LEAN BONELESS PICNICS	}
3½ LBS.	SWIFT'S FOOD PROTEIN (S.F.P.)	
2 LBS.	FRESH ONIONS	
8 OZ.	SALT	
7 OZ.	GROUND BLACK PEPPER	
2 OZ.	GROUND MACE	
2 OZ.	GROUND CORIANDER	
6 OZ.	FRESH GARLIC	
23 LBS.	SHAVED ICE	

GRIND CHUCKS AND ONIONS THROUGH 1/8 INCH PLATE. GRIND THE OTHER MEAT PRODUCTS SEPARATELY THROUGH 3/8 INCH PLATE. CHOP GARLIC FINE AND MIX WITH SALT. PLACE BONELESS CHUCKS IN SILENT CUTTER, ADD S.F.P. AND SHAVED ICE ALTERNATELY UNTIL ALL THE S.F.P. IS USED. 23 LBS. OF SHAVED ICE IS INCORPORATED IN TOTAL.

PUT PORK MEATS INTO MIXER. ADD BEEF EMULSION AND SEASONING, MIX THOROUGHLY. STUFF INTO APPROPRIATE CELLULOSE CASINGS OR BEEF MIDDLES.

PLACE IN SMOKEHOUSE, STARTING AT 120° F. AND GRADUALLY RAISING TO 170° F. SMOKE TO DESIRED COLOR. COOK TO INTERNAL TEMPERATURE OF 151-155° F. SHOWER WITH COLD WATER TO INTERNAL TEMPERATURE OF 90° F. WHEN DRY STORE IN COOLER AT 26-30° F.

BRAUNSCHWEIGER-LIVER STYLE SAUSAGE

25 LBS.	PORK LIVERS	
4 LBS.	SKINNED PORK JOWLS	
4 LBS.	SWIFT'S FOOD PROTEIN (S.F.P.)	
3 LBS.	SALT	
4 OZ.	ONION POWDER	
4 OZ.	GROUND WHITE PEPPER	
2 OZ.	GROUND GINGER	
1 OZ.	GROUND MARJORAM	
1 OZ.	FRESH GARLIC	
4 LBS.	SHAVED ICE	
1 OZ.	NITRITE	
3/4 OZ.	NITRITE	

GRIND PORK LIVERS THROUGH 1/8 INCH PLATE, GRIND JOWLS THROUGH 1/4 INCH PLATE. CHOP GARLIC FINE AND MIX WITH CURE.

PLACE GROUND LIVERS IN SILENT CUTTER. ADD SALT, CURE, S.F.P. AND SHAVED ICE. WHEN BUBBLES APPEAR ON SURFACE, ADD GROUND JOWLS AND SEASONINGS. CHOP FINE, STUFF INTO HOG BUNGS OR OPAQUE CELLULOSE CASING OF APPROPRIATE SIZE.

COOK AT 160-165° F. FOR 1 TO 1-1/2 HOURS. CHILL QUICKLY IN ICE WATER UNTIL FIRMLY SET. SMOKE AT 90° - 120° F. UNTIL GOOD COLOR DEVELOPS.

9.9.20

GROUND BEEF PROTEIN ADDED

ANY GROUND OR CHOPPED MEAT PRODUCT EITHER BULK OR PATTIED SHOULD BE CONSIDERED SATISFACTORY TO COMBINE WITH S.F.P.

THE FOLLOWING ARE SUGGESTED FORMULAS AND MIXING PROCEDURES. FORMULA #3 HAS BEEN FOUND MOST ACCEPTABLE AND FORMULA #2 SHOULD BE CONSIDERED THE MAXIMUM USAGE.

FORMULAS:

SAMPLE	(22-25% FAT) BEEF/LBS.	S.F.P./LBS.	WATER/LBS.
NO. 1	84	4	12
NO. 2	100	5	15
NO. 3	100	4	12

PROCEDURE:

1. ALLOW SWIFT'S FOOD PROTEIN TO REHYDRATE IN 40° F. WATER (AMOUNT AS INDICATED ABOVE) FOR 10 TO 15 MINUTES. (A)
2. PLACE NORMAL BLEND OF CUTS (CHUCKS, FLANKS, PLATES, TRIMMINGS, ETC.) INTO GRINDER HOPPER AND DISTRIBUTE THE REHYDRATED S.F.P. THROUGHOUT.
3. GRIND THROUGH 1/2 OR 3/8" PLATE MIXER.
4. MIX FOR 60 TO 90 SECONDS. (B)
5. GRIND THROUGH 1/8" PLATE AND BAG FOR BULK OR "HOLLYMATIC" FOR PATTIES.

(A) COLD TAP WATER WILL SUFFICE.
(B) IF MIXER IS NOT AVAILABLE, TUMBLE 3 OR 4 TIMES BY HAND.

WHEN GROUND BEEF, VEAL OR PORK IS CONDITIONED WITH S.F.P., THE END PRODUCT SHOULD:

1. BE MORE MACHINABLE IN AUTOMATIC EQUIPMENT
2. SHRINK 10 TO 15% LESS
3. HAVE IMPROVED TENDERNESS AND JUICINESS
4. BE LOWER IN TOTAL FORMULATION COST BY $5/7/CWT.

POINTS THAT WILL HELP SELL YOUR CUSTOMERS:

1. LESS SHRINKAGE IN FRYING OR GRILLING THAN ALL MEAT PATTY.
2. PATTY IS "JUICY" RATHER THAN DRY OR TOUGH.
3. WILL NOT "WEEP" WHEN FROZEN.
4. WILL GIVE A QUALITY PATTY WITH MORE BUN COVERAGE.

REMINDER: THE LOWER THE TEMPERATURE OF THE PROCESSED MEAT, THE LONGER THE SHELF LIFE OF THE PATTY.

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
MEAT INSPECTION DIVISION
WASHINGTON 25, D.C.

ZY-
MID-63-23
JULY 23, 1963

TO: INSPECTORS IN CHARGE OF MEAT INSPECTION

FROM: E. A. MURPHY, CHIEF STAFF OFFICER FOR PROCEDURES AND REQUIREMENTS

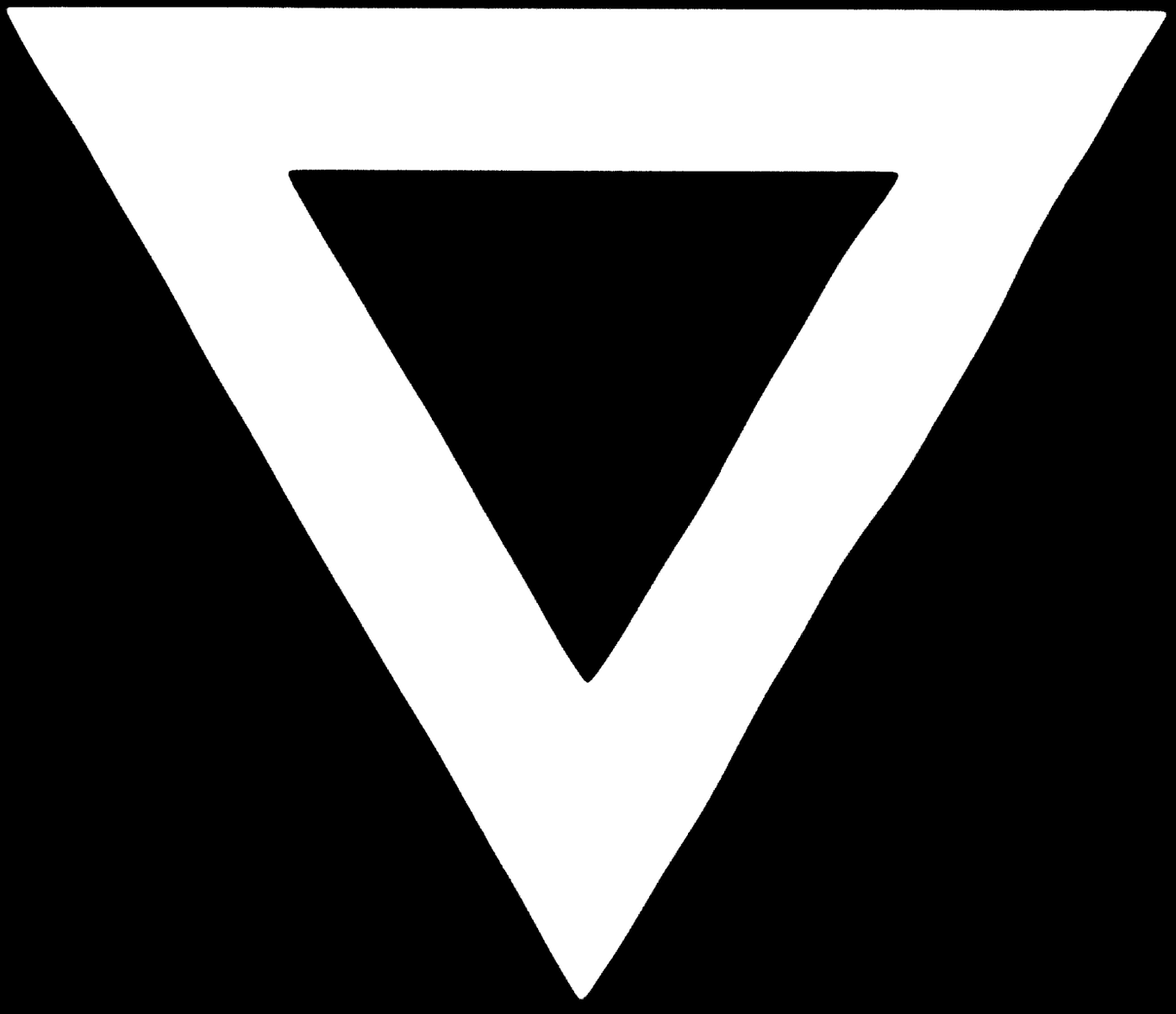
SUBJECT: IDENTIFY AND CONTROL OF SOY BEAN DERIVATIVES

A NUMBER OF SOY BEAN DERIVATIVES HAVE BEEN PROPOSED FOR USE AS INGREDIENTS IN MEAT FOOD PRODUCTS. THE DIVISION HAS ACCEPTED SOY FLOUR, SODIUM SOY PROTEIN, SOY PROTEIN CONCENTRATE ARE THE ONLY SOY DERIVATIVES APPROVED FOR USE IN SAUSAGE. THE USE OF ISOLATED SOY PROTEIN AND SODIUM SOY PROTEIN IS RESTRICTED TO NONSPECIFIC LOAVES, IMITATION SAUSAGE, MEAT PATTIES, SOUPS, STEWS AND THE LIKE. SOY PREPARATIONS, OTHER THAN THOSE MENTIONED OR SOY DERIVATIVES HAVING A PROTEIN CONTENT OTHER THAN THAT EXPECTED FOR THESE STANDARDIZED ITEMS, HAVE NOT BEEN ACCEPTED FOR USE IN FEDERALLY INSPECTED PRODUCTS. SOYBEAN DERIVATIVES FOR WHICH THE CATEGORY OR PROTEIN CONTENT IS QUESTIONABLE SHOULD BE SUBMITTED FOR LABORATORY DETERMINATION.

SOY PROTEIN CONCENTRATE, SOY FLOUR AND ISOLATED SOY PROTEIN ARE PRACTICALLY INDISTINGUISHABLE BY VISUAL EXAMINATION. THEY MAY ALSO CLOSELY RESEMBLE SODIUM CASCINATE, NONFAT DRY MILK AND CERTAIN CEREALS. METHODS ARE NOT AVAILABLE FOR DISTINGUISHING ISOLATED SOY PROTEIN FROM OTHER SOY DERIVATIVES IN FINISHED MEAT PRODUCTS. THEREFORE, IF THE ESTABLISHMENT STOCKS MORE THAN ONE TYPE OF SOY PRODUCT, ADDITIONAL CONTROLS ARE REQUIRED. THESE INCLUDE DEVELOPING WITH THE ESTABLISHMENT A PROCEDURE FOR CONTAINING SOY PRODUCTS FOR POSITIVE IDENTIFICATION AND MAINTAINING DAILY RECORDS SHOWING AMOUNTS OF SOYBEAN DERIVATIVES USED AND THE TYPE OF PRODUCT PREPARED.

E. A. MURPHY

B-560



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