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DEVELOPMENT OF BIODEGRADABLE WASTE MANAGEMENT SYSTEM IN
SALAD BUSINESS

Case Study: Oy Fresh Servant Ab

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ABSTRACT

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Name of thesis DEVELOPMENT OF BIODEGRADABLE WASTE MANAGEMENT SYSTEM IN SALAD BUSINESS Case Study: Oy Fresh Servant Ab		
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<p>Oy Fresh Servant Ab is an innovative family-owned company in the city of Pietarsaari. Nowadays it is one of the biggest names in food and salad producing business in Finland. The company produces thousands of kilos of salad everyday so the waste from the raw material is quite high. It is very important for the company to keep records of food as well as salad waste in a proper way.</p> <p>The aim of this research was to focus on the management and handling of biodegradable waste in the production area. Due to high production the company generates considerable amount of food and salad waste. This waste is sold to a few partner companies who are interested in buying biodegradable waste. Therefore the waste needs to be well cared as well as recorded in a correct way.</p> <p>Qualitative research method has been used to analyze data for this research. A semi-structured form of interview has also been used to analyze the impact of handling as well as processing of waste in the production area. The chief of the production and logistic department, a shift leader and one worker from production department has been interviewed and their opinion has been analyzed for come up with findings and recommendations for further development of waste management of this company.</p>		

Key words

Biodegradable, company, management, salad, waste

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1 INTRODUCTION

When it comes to food habits certainly these differ from region to region. People living in different corners of the world have different food habits. Adding green fresh vegetables in food menu has always been considered as one of the healthy ways to fit physically. In Finland there are few companies who produce different kind of salad of fresh vegetables. Oy Fresh Servant Ab is one of Finland's large salad makers of green fresh vegetables and popular for their healthy and different kinds of delicious salads.

The process of producing salad is done in a unique way. It begins from purchasing fresh vegetables and fruits from other parties then processing them by a group of experts and experienced workers in a highly hygienic area as well as packaging them properly using automatic machines. The vegetable waste from the raw materials is stored for producing biogas. Fresh servant does not produce biogas by itself but sells all the waste to the nearest biogas plant. After each certain period of time the company sells a large amount of salad waste to the gas producing company. The company measures the salad waste and sends them to the gas plant. By selling vegetable waste to the biogas plant the company earns some revenues as well. In this thesis the researcher is going to focus the measurement process of salad waste and determine the advantages, disadvantages as well as the efficiency of the current measurement procedure.

This thesis is a case study of a Finnish salad producing company Oy Fresh Servant Ab. Basically a case study is a descriptive, explanatory analysis of a person, organization or an event. In other words it can be defined as a research strategy, an empirical enquiry which investigates a phenomenon within its real-life context. The case study is considered as a strategy that begins with logic of design, a strategy to be preferred when circumstances

and research problems are appropriate rather than an ideological commitment to be followed in any circumstances.

Oy Fresh Servant Ab is an innovative family-owned company in the city of Pietarsaari. The company was established early in 1995. Before 1995 the company ran under the renowned meat producing company Oy Snellman Ab. The former name of Oy Fresh Servant Ab was Oy Snellman Ab Grönsaksparti. Today the company has branches in two cities at Pietarsaari, and at Vaasa in Finland.

Fresh Servant started as a small local wholesaler in the beginning. Later the area of operation has grown steadily to cover the whole of Finland. The company has achieved a good market position in Finland. Continuous development in product segments is the main reason behind the success in salad business. The operating principle of the company is to keep good relationship with its clients and its own direct import of guaranteed high-quality raw materials and fresh product. It is very important for the company to know the origin of the products they sell. The company is determined to build a long-term cooperation in the supply chain from farm to fork.

Fresh Servant is a forerunner in producing different lunch salads, providing well processed vegetables and varieties of seasonal as well as non-seasonal fruits for schools, hospitals, restaurants and delivering packed fruits and vegetables for the retail market. With the invention and introduction of tray salads in Finland in 1998, Fresh servant was the originator of the retail package salad type and the founder of producing ready-to-eat salads available to its customers nationwide in 2006.

Oy Fresh Servant Ab is the pioneer of lunch salad and well refined pre-packed fruits and vegetables in the food service. Lunch salad production has been started since 1998. During the early 2000s was Fresh Servant the first provider in Finland with nationwide distribution of fresh salads. Company's operations are divided into two areas. One of them is fresh Product development, manufacturing, sales and another one is marketing fresh value-added fruit and products made of vegetable and concepts to the retailers. Fresh Wholesaler is specialized on fruit and vegetable wholesale. The product concept is based on the acquisition of own contracted farmer's products as well as storing, selling, distributing, and importing of fruits and vegetables.

The aim of a research is to enlighten the action. The researcher's thesis must seek to contextualize its information within the greater body of research. A research should be good quality in order to produce knowledge that is suitable outside of the research environment with implications that go beyond the group that has been attained in the research. Moreover, the outcomes of the study should have implications for policy and project implementation.

The company has a spacious production area where the raw materials are brought and processed to final product. All the waste are collected in the production area and sent to the big garbage bin. When the garbage bin is loaded of waste the garbage carrying truck takes all the waste to the biogas plant or to some other interested party. Before collecting the biodegradable waste to the garbage bin from the production area these waste are weighed manually by using the weight measuring machine and later disposed through a vacuum tube to the garbage bin. The focus of this study is to verify the measurement or weighing process as it is very important for the company to keep the record of biodegradable waste which is collected from vegetables and salads. After a certain period of time the company sells tons of biodegradable waste to the gas plant and earns revenues by selling waste.

The company is to keep exact record of their sold waste so therefore they gain the right value of it. The measurement process is manual and there is no individual to measure the waste. It is seen common workers who are performing production related jobs are responsible to weigh the waste and keep the record before vacuuming it to trash bin. Since the workers concentrate to their own production related job the work pressure might make them to forget to measure the biodegradable waste before vacuuming. If this happens now and then, the company will not get the exact record of waste they are selling to the gas plant. Therefore there is a probability of losing a large amount of revenue from the sold waste. Also the company needs to know the exact amount of waste in order to calculate their production cost since these food waste are the part of the raw materials. Therefore the whole wastes measurement process is very important for the company.

The aim of the thesis is to focus how effective is the current biodegradable waste measurement system in the factory as well as developing the whole process. The objective of this research is to collect data as well as information of the waste measurement process inside the production area. To collect the data and necessary information for this research semi-structured interview and direct observation will be used as research method.

The motive of a research is to inform action. Thus, a researcher's research needs to seek to contextualize its findings within greater body of research. In order to produce knowledge a research must hold to its quality which is applicable to use outside of the research setting with implications that go beyond the group which has already participated in the research. The outcomes of a research should have implications for policy and project as well.

In this research work the researcher has used qualitative research method as research methodology. Qualitative research methodology contains various research methods. Semi-structured interview and direct observation are two of them. The researcher has used semi-structured interview as well as direct observation as research methods in this research. As the focus of this study is to develop the biodegradable waste measurement system as well as to find out the ways that will develop the whole system so that the whole measurement process can be done more easily and accurately.

Qualitative research is an effort to understand the situation in their uniqueness as part of a particular context and the interactions there. This understanding is an end in itself, so that it is not attempting to predict- what may happen in future necessarily, but to understand the nature of that setting what it means for participants to be in that setting, what their lives are like, what's going on for them, what their meanings are, what the worlds look like in that particular settings- and in the analysis to be able to communicate that faithfully to others who are interested in that setting. The analysis strives for depth of understanding.

This research work is divided into four parts. Each part has its own significance as well importance to produce an effective solution for the company. The first part is an introductory part. The topic of the research and its features have been focused in this part. It gives an idea about the study as well as the reason and purpose of the study. Different problems of this research are also discussed in this part.

In this part of the company Fresh Servant Oy Ab is introduced as well. The history of the company has been focused here. The main purpose of this chapter is to discuss the biodegradable waste management system of the company. The overall process of measuring waste has been discussed in this chapter. The affects on the environment and production is also illustrated in this chapter.

The second part focuses on the literature that supports this study. In this part the definition of waste, different types of waste as well as the waste management in Finland is brought into focus in detail. Various charts have been drawn and been discussed to show a clear view of the waste should be categorized. Production management theory has been illustrated and the importance of the production management to the firm has been discussed.

The research plan begins from the third part of this thesis. Under this part the chosen research methods and the process has been focused on. The research process includes data collecting methods as well as the result to testify whether the current biodegradable waste measurement system is good enough for the company or not. Also some recommendations to develop the whole system will be added in this part. It is assumed the new proposed system will be able to show a better system to measure the waste as well as create new possibilities for the company. In the conclusion part the summary of the study as well as the research result is discussed.

Oy Fresh Servant Ab sells salad waste to the nearest biogas plant called Jeppo Biogas Ab. Jeppo Biogas Ltd has taken initiatives of the construction of a biogas plant in Jeppo Uusikaarlepyy, Finland. The gas plant collects all the biodegradable waste and digests fungi from agriculture, food waste and other organic by-products. The final product is obtained alongside biogas which is high quality fertilizer products that can be used in agriculture.

Jeppo Biogas Ltd's projects are connected with several industrial companies from the neighborhood as well as the local power cooperative. Local keepers and the region's industry for raw materials are delivered to this site. Annual receiving capacity for biogas

is approximately 90 000 tones. The produced biogas is processed into pure methane in an upgrade unit and used in heat production in the region's industry and as a transport fuel in the near future. According to the company website the company has started the process in autumn 2013.

2 WASTE AND PRODUCTION MANAGEMENT THEORY

The term 'waste' refers to some sort of portable objects which are neither wanted nor desired by their owners, for which orderly removal is in the public interest. According to financial point of view, waste consists of unwanted objects or materials that do not hold any financial value neither at present nor in the future as well as there are no demands for them in the market place. That is why storing of waste might create some sort of financial or other disadvantage to the owner. With proper treatment waste can be recycled or re-used as well as change into a new product or energy depending on the type of waste. The management of waste includes formation, treatment and disposal of waste materials and resulting products. Analyzing the entire material flow across the board of human activities holds a great possibility to solve root problems concerning waste management. Every influence that affects each material is isolated as well as analyzed for certain environment. These environments can be private households, industries or means of transport and so on. (Lemann, 2008, 29-31).

2.1 Problems in defining and measuring waste

Waste can be identified in different ways. Each discipline defines waste according to their own way therefore they might be different from each other. For example, how a public official may define waste can be different than the perspective of an engineer or a city planner. Even questions have been raised about the accuracy of statistical data that shows how much waste is generated and being disposed each year. According to state regulations some state materials such as construction debris is considered as municipal waste; on the other hand some other states might consider construction debris under other

category. Medical waste and contaminated soil is considered as hazardous waste in some states while other states consider these waste materials as biohazard. Some waste that are managed at the site where they are generated for example manufacturing facility are not rated as the part of total because they never go through the collection and disposal processing system. Due to lack of agreement about definition and lack of accurate statistical data make it different for policy managers to determine how serious the problem might be as well as how best to face and solve it. (Vaughn 2009)

2.2 General Definition of Waste

“Wastes are materials that are not prime objects (that is product produced for the markets) for which the initial user has no future use in terms of his/her own purposes of production, transformation or consumptions, and of which he/she wants to dispose. Wastes may be generated during the extractions of raw materials, the processing of raw materials into intermediate and final products, the consumptions of final products, and the other human activities. Residuals recycled or reused at the place of generation are excluded.” (“Glossary of Environment Statistics.” 1997. UNSD. 1997.)

Waste can be called as rubbish or garbage as well. Undoubtedly the word waste is a pejorative term for unwanted material that has no value to its owner. The term waste can be considered as subjective or incorrect because of the value of waste varies from person to person; in easy words, what is waste to one person might not be waste to another person. So basically waste is a term for unwanted materials. (Vaughn 2009)

2.3 Types of wastes

Waste has been categorized in various categories depending on state or country law, authors as well as researcher's study. In different books, journals and scholars' articles wastes has been categorized in different categories. Basically waste can be solid or liquid. Both can be either hazardous or non hazardous. These solid and liquid wastes can also be grouped into organic or biodegradable, re-useable and recyclable wastes. Below the general types of wastes are discussed below. (eschooltoday 2010)

Waste can be in non-solid form. Some solid waste can also be converted into liquid form for the purpose of disposal. This includes both point source as well as non-point source discharges such as storm water or waste water. Wash water from household, liquids used for cleaning in industries, waste detergents are the example of liquid waste. Any kind of garbage, refuse or rubbish that comes from household, industries or any other public places are predominantly known as solid waste. Examples of this kind of waste are old car tires, old news papers, glasses, broken furniture, and food waste. In other words any kind of non-liquid waste is solid waste. Hazardous waste is those types of waste which are harmful for environment and lives. These are potentially threatened to public health as well as play a deeper role to pollute environment. Hazardous waste could be inflammable, reactive, corrosive or toxic. The example of this type of wastes could be fire extinguishers, old propane tanks, pesticides, mercury containing equipments such as thermometer, fluorescent bulbs, batteries etc. Another type of waste is organic type which is also known as biodegradable type. This type of waste normally comes from trees, plants, foods and animal sources. Basically all the food waste, fruit and vegetable peels, flower trimming are included in this category. Animal dung could be classified as organic waste as well. Organic waste is biodegradable. This means the type of waste is easily broken down by other organisms over time and turned into manure. Moreover it is possible to turn organic waste into compost as well as use them in gardens. (eschooltoday 2010). 'Recycling means

using products and materials again to make new products instead of throwing them away.' (Walker 2007)

The term recycling refers to the process of used materials (waste as an example) into new as well as useful product. Recycling helps to reduce the use of raw materials that have been used in production. Recyclable waste means the waste that could be potentially recycled. Aluminum products such as soda, milk, tomato cans. Plastics such as grocery shopping bags, plastic bottles. Glass products such as wine or beer bottles, broken glass. Paper products such as used envelopes, old news papers, magazines, cardboard boxes can be recycled and categorized in this category. (eschooltoday 2010)

2.4 Definition of Biodegradable waste

The term Bio-waste is defined as biodegradable garden as well as park waste, food and kitchen waste from household, restaurants, cafeterias, caterer and retail sites and comparable wastes from food processing plants. Waste such as forestry or agricultural residues, manure, sewage sludge, or other biodegradable waste such as natural textiles, paper or processed are not included in this particular category of waste. It does not include those by-products of food production that never become waste. (Environment 2014)

There are quite good use of biodegradable wastes. These particular type of waste can be used for composting, might be a resource for heating, electricity as well as gasoline near future. Biodegradable waste is capable to produce bio-gas as well as delivers compost for the soil. As it is a total developed system it produced 27 million kwh (kilowatt hour) of electricity as well as biogas back in 2009. According to the source (Wikipedia) in last 15 years the oldest of companies own Lorries has got 1.000.000 kilometers driven with biogas from household wastes. The production of methane from such waste decomposing in

landfills has appeared as an environmental threat from bio waste as well as other bio degradable waste that accounted for some 3% of total green house gas emissions in the EU-15 in 1995. (Environment 2014)

2.5 Waste Management in Finland

With the aim of protecting environment and public health the handling as well as sorting of municipal waste is regulated by Finnish law. According to the Refuse Act, 'The production of waste should be prevented. One should consider at the place of purchase already how much and what kind of waste a product and its packaging are likely to cause and choose the least polluting option.'

It is prohibited to litter, to leave garbage in an open place, to burn garbage or trashes in the open fire or a barrel. All kinds of waste or rubbish must be placed in designated garbage collection bins. Hazardous waste and toxic substances are not allowed to store in a same bin with other sort of waste. They must be delivered to a drop-off collection place for household toxic or hazardous waste. (biohalo.tiedottaa)

When it comes about biodegradable waste, it is a must to collect and place biodegradable wastes in a separate designated bin. Later on those waste is collected as well as transferred for composting. Then the resulting humus soil is used for gardening and other cultivation related work. (biohalo.tiedottaa)

In Finland, various soft drinks and alcoholic beverages are produced as well as manufactured. These beverages are normally filled in either refillable glass bottles (0.33, 0.5 or 1 liter) or refillable PAT plastic bottle (0.5, 1, 1.5 liters). These cans and bottles are returnable or can be returned into shops or ALKO. Depending on the size of the bottle a deposited payment of 10-40 cents is paid back when the bottle or can is returned. Returned

cans are reused as a source of raw materials where bottles are washed and reused several times. (biohalo.tiedottaa)

<p>Mixed Municipal Waste</p> <p>Please, put into the dry waste collection bin:</p> <ul style="list-style-type: none"> + All waste that has no specific collection bin + If the collection site has designated bins for reusable waste (such as paper, cardboard, metal and glass) this waste should be placed primarily in their own collection bins. <p>Please, do not put into the dry waste collection bin:</p> <ul style="list-style-type: none"> - Hazardous waste (waste harmful to health and the environment (such as batteries, fuel cells, unused medicines) - Returnable bottles (refillable glass bottles or refillable PET plastic bottles) 	<p>Dry waste</p> <p>Please, put into the dry waste collection bin:</p> <ul style="list-style-type: none"> + All waste that has no specific collection bin <p>Please, do not put into the dry waste collection bin:</p> <ul style="list-style-type: none"> - Biodegradable waste - Hazardous waste - Returnable bottles <p>Biodegradable waste must be separated from dry waste.</p>
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GRAPH 1. Do's and Don'ts for mixed municipal waste and dry waste (adapted from Waste Management in Finland 2014)

Graph 1 explains the general rules for disposing mixed municipal waste and dry waste. The mixed municipal waste as well as the dry waste follows the rules. If the waste has no specific collection bin for it then it is stored in the dry waste collection bin. But if the waste has specific collection bin such as paper, cardboard, metal and glass then these waste cannot be stored in the dry collection bin, instead they must be stored in their own bins. All the biodegradable waste, hazardous wastes such as batteries, fuel cells, medicines and returnable bottles must be separated than dry waste. (biohalo.tiedottaa)

Biodegradable waste	
Please, put into the bio waste collection bin:	Please, do not put into the bio waste collection bin:
+ fruit and vegetable peels	- plastic, glass, rubber or leather
+ fish and meat scraps	- Toxins, paints, solvents etc.
+ coffee filters and tea bags	- cigarette ends or chewing gum
+ soft and moist tissue papers	- colored commercial leaflets
+ cooking oil and fats	- ash or lime
+ eggshells and egg cartons (shredded)	
+ pet droppings	
+ gardening waste	
Please pack bio waste in a newspaper, paper bag or in a bio-decomposable bag. Do not pack bio waste in a plastic bag.	

GRAPH 2. Do's and Don'ts for Biodegradable waste (adapted from Waste Management in Finland 2014)

Graph 2 shows what types of waste are allowed to be stored in a biodegradable waste bin and what are not allowed. Biodegradable waste such as fruit and vegetable peels, fish and meat scraps, coffee filters and tea bags, soft and moist tissue papers, cooking oil and fats, eggshells and egg cartons (shredded), pet droppings, gardening waste can be stored in a biodegradable waste bin. Wastes such as plastic, glass, rubber or leather, toxins, paints, solvents, cigarette ends or chewing gum, colored commercial leaflets, ash or lime must be separated from biodegradable wastes. (biohalo.tiedottaa)

Paper	Glass
<p>Please, put into the paper collection bin:</p> <ul style="list-style-type: none"> + newspapers and magazines + commercial leaflets and envelopes + telephone directories and books + recycled paper <p>Please, do not put into the paper collection bin:</p> <ul style="list-style-type: none"> - disposable dishes, food packages or cardboard - wrapping paper 	<p>Please, put into the glass collection bin:</p> <ul style="list-style-type: none"> + clear and colored glass (bottles and jars) <p>Please, do not put into the glass collection bin:</p> <ul style="list-style-type: none"> - porcelain or ceramics - plastic or aluminium - light bulbs - windows, mirrors and windshield glass - crystal

GRAPH 3. Do's and Don'ts for Paper and Glass. (Adapted from Waste Management in Finland 2014)

Graph 3 shows the differences between paper and glass waste. Newspapers and magazines, commercial leaflets and envelopes, telephone directories and books, recycled paper are allowed to be stored in the designated waste bin for papers. All the disposable dishes, food packages or cardboard and wrapping papers must be separated from the

paper bins. Similarly all the waste that is generated of glass for example glass bottles and jars made of glass should be kept in the specific bin for glass except light bulbs, window mirrors, windshield glass, and ceramics and so on. (biohalo.tiedottaa)

Cardboard	
Please, put into the cardboard collection bin:	Please, do not put into the cardboard collection bin:
+ paper or board-based packages	- wet or dirty cardboard
+ biscuit and cereal packages	- dirty packages
+ paper bags (for example sugar and flour packages)	-plastic
+ egg and fruit cartons	
+ milk, juice and yoghurt cartons	
+ aluminum-coated juice cartons	
+ brown paper bags and envelopes	
+ clean disposable dishes	

GRAPH 4. Do's and Don'ts for Cardboard waste (adapted from Waste Management in Finland 2014)

Graph 4 shows what type of waste is allowed to store in the cardboard collection bin and what are not allowed. Basically paper or board-based packages, biscuit and cereal packages, paper bags (for example sugar and flour packages), egg and fruit cartons, milk, juice and yoghurt cartons, aluminum-coated juice cartons, brown paper bags and

envelopes, clean disposable dishes are allowed to put in the same bin which is selected for cardboard. There are certain types of waste that are not allowed to store in the waste bin that is used for cardboard. These objects are wet or dirty cardboard, dirty packages and plastic which cannot be mixed with the other waste in cardboard waste bin. (biohalo.tiedottaa)

Metal	Combustible waste
<p data-bbox="207 678 756 709">Please, put into the metal collection bin:</p> <ul style="list-style-type: none"> <li data-bbox="207 772 350 804">+ tins/cans <li data-bbox="207 867 553 898">+ aluminum foil and trays <li data-bbox="207 961 485 993">+ metal lids and caps <p data-bbox="207 1056 821 1150">Please, do not put into the metal collection bin:</p> <ul style="list-style-type: none"> <li data-bbox="207 1213 388 1245">- aerosol cans <li data-bbox="207 1308 683 1339">- batteries or other hazardous waste 	<p data-bbox="846 678 1182 709">Combustible wastes are:</p> <ul style="list-style-type: none"> <li data-bbox="846 741 1097 772">+ paper, cardboard <li data-bbox="846 804 946 835">+ wood <p data-bbox="846 856 1230 888">Not combustible wastes are:</p> <ul style="list-style-type: none"> <li data-bbox="846 919 951 951">- plastic <li data-bbox="846 982 938 1014">- metal <li data-bbox="846 1045 930 1077">- glass <li data-bbox="846 1108 979 1140">- ceramics <li data-bbox="846 1161 1089 1192">- hazardous waste <li data-bbox="846 1224 1157 1255">- rubber, leather, textile

GRAPH 5. Do's and Don'ts for metal and combustible waste (adapted from Waste Management in Finland 2014)

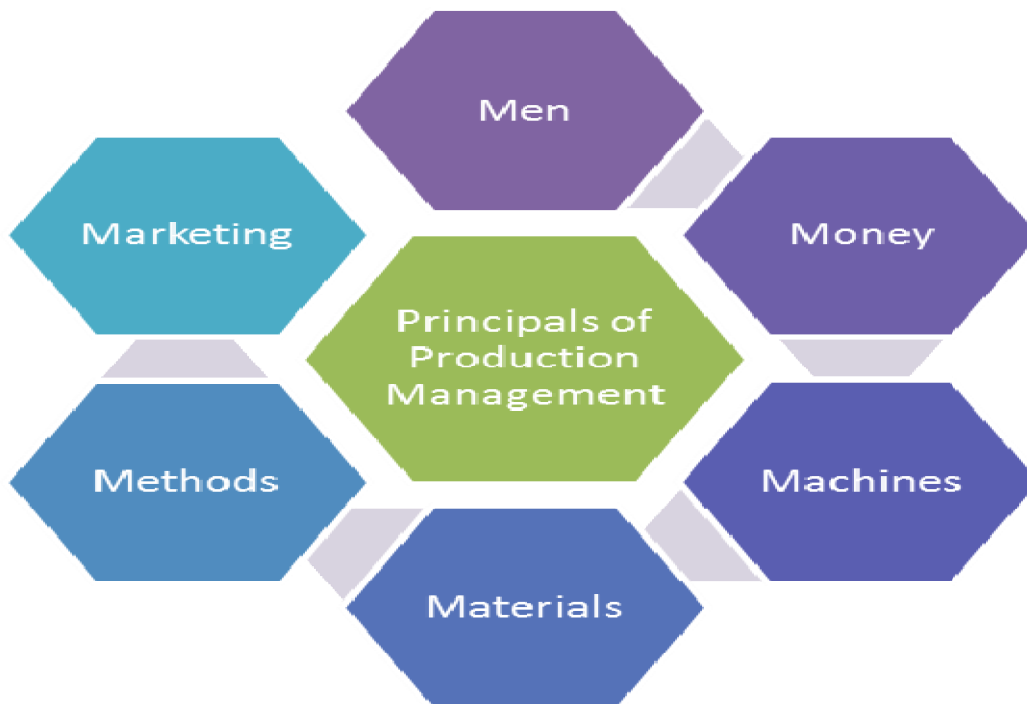
Graph 5 gives shows the clear view of metal waste and combustible waste. This graph shows the objects that are allowed to store in the same bin as well as the waste that must be stored in a different bin. For example tins/cans, aluminum foil and trays, metal lids and caps are allowed to store in metal bin but other waste for example, aerosol cans, batteries or other hazardous waste must be separated as well as kept in a separate waste bin. For combustible waste, paper, cardboard and woods can be kept in the designated bin but

waste for example, plastic, metal, glass, ceramics, hazardous waste, rubber, leather, and textile must be kept in a separate bin. (biohalo.tiedottaa)

2.6 Definition of production management

“Production/Operation management is a process, which combines and transforms various resources used in production/operation subsystem of the organization into value added products/services in a controlled manner as per the policies of the organization. Therefore, it is that part of an organization, which is concerned with the transformation of a range of inputs into the required (product/services) having the requisite quality level.” (Kumar 2006, p.1)

The term production management refers to planning, organizing, directing and controlling of all kinds of production related activities. Production management controls and manages every job in production as well as deals with converting raw materials into finished goods or products. With the aim of satisfying people's need it combines together the 6M's of management that is Men, Money, Machines, Materials, Methods and Markets. It deals with decision making regarding the quality, quantity and cost of production as well. (Winman, 2013)



GRAPH 7: The 6ms' of Management (adapted from Winman 2013)

Production management is not just an individual concept but it is a part of business management. The main goal of production management is to make sure the quality production of goods or services maintaining right quantity, right time as well as at right cost. Proper management ensures the improvement of the efficiency. (Kalyan-city 2011)

As this research is going to do a proper investigation on biodegradable waste measurement system of the company Oy Fresh servant Ab as well as to find a proper solution that will help the company to improve the waste measuring system in the future hopefully by implementing proper production management focusing on this particular problem.

2.7 Importance of Production Management

There is no doubt that an efficient, well organized and well developed organization faces competition in the corporate world. Therefore the total or optimum utilization of available production capacity can be ensured by following proper production management. Production management helps a business firm to reach its goal or objectives by producing good quality product which meets the consumer's demand. As a result the firm increases its sales. A good will or good reputation affects to a business organization. Production management helps to control company's production, market as well as profit. Production management also helps a firm or organization to gain good reputation which helps the firm to expand as well as to grow bigger. (Kalyan-city 2011)

Proper production management helps a firm to improve new products as well as ideas in the market which conducts Research and Development (R&D). It helps the firm to produce latest as well as better quality products. An effective management always brings new useful changes as well as develops new system inside the production department of a factory that motivates the workers as well as helps to grow responsibilities to their job. Production management influences other functional areas in an organization such as finance, marketing, human resource (personnel). Proper production management helps the marketing department to sell more products therefore the company gets more funds due to increase in sales. It is easier for the company to get more loans as well as share capital for expansion and modernization.

Better performance of the production department allows the personnel department to manage the human resource effectively as well. Since production management helps to produce good quality products at right time at right place, all these developments help the firm to face the competition in the market. Optimum utilization of resources for example man power, machines can be facilitated by production management; therefore it helps the firm to meet its capacity utilization objectives which brings higher returns to the company.

By adopting proper management the company can reduce its production cost. It will help to maximize its output as well as minimize its input. Due to helping the firm to improve its product quality as well as reduce production cost, a proper production management helps the firm to expand which leads the firm to gain more profitability. (Kalyan-city 2011)

Production management conducts continuous research and development therefore the company produces different and better quality of products which make people to enjoy a better standard of living. Production activities create many different job opportunities in the society directly or indirectly. Direct employment is generated in production related area as well as indirect employment is generated in supporting areas for example marketing, financing and customer care. Due to research and development, production management helps to produce quality products. Large scale of production brings economies that bring down the cost of production as well as local customers get the product in cheaper price. Production management creates Form Utility. Customers can get form utility in the shape, design as well as size of the product. Moreover it creates time utility as well since the goods are available whenever customer needs it. Optimum utilization of resources as well as effective production of goods and services are ensured by production management which leads to speedy economy growth, wellbeing of the nation as well as boosts the overall economy. (Kalyan-city 2011)

3 RESEARCH METHODS AND ANALYSIS

The qualitative research includes interview and observation. The researcher thinks the best way to get the most accurate information by interviewing the workers. Currently more than 80 workers are employed in production (according to the working schedule). Interviewing the workers can be more fruitful as the workers are the core of a factory having the knowledge about the entire production related job. In this research work the best way to collect accurate data is by interviewing the workers or stuffs. In the interview session the interviewees have answered of few questions related to waste management system. For example the worker's personal opinion about the current system, what are the physical as well as environmental effects, how accurate the measurement system is as well as some development related questions and.

During the interview a small group of workers have been chosen for interview. The selection of interviewee was depending on their age, nation, rank and experience. Semi-structured interview method has been used to collect data. A few appointments have been arranged with each of the interviewees for the interview.

Semi-structured interview is the combination of the unstructured, open-ended interview with the directionality and agenda of the survey instrument to create focused, qualitative as well as textual data at the factor level. The selected questions for semi-structured interview are pre-formulated but the answers to those questions are open-ended. The answers can be fully expanded as well as explained at the discretion of the interviewer and the interviewee. (Schensul 1999)

'Semi-structured interviews consist of pre-determined questions related to domains of interest, administered to a representative sample of respondents to confirm study domains and identity factors, variables, and items or attributes of variables for analysis or use in a survey.' (Schensul 1999)

3.1 Presenting the result of the research

The data for this research has been found by interviewing individuals who are actively involved with production. There were three interviewees and each of them plays a different role than others at their work place. Interviewee A is the chief of production and logistic department of Fresh servant who recently rejoined Fresh servant and has a previous working experience in the company. Interviewee B is one of the shift leaders of the production area and has a working experience of over nine years. Interviewee C is a production worker who has been working in Fresh servant for five years. The opinions and views of these people are highly important to come up with findings and recommendation for this work. The ages of the interviewees are between 26 to 42 years age. Though it would seem unfair to draw a finishing line from these interviews but this will be very helpful for a research of this kind. In order to come to a valid conclusion professionals' views are very important.

3.1.1 Presenting the interview with interviewee A

Interviewee A has a good working experience in the field of salad business and currently holding the position of production and logistic chief in Fresh servant.

Theme 1: The economic impacts of waste management process on the company. The aim of this interview is to get a clear understanding about the economic impacts, the importance of measuring the salad waste as well as the possible benefits that the company receives by keeping the waste record.

When interviewee A was asked about the importance of selling the waste to the third party, the answer was,

“It is important due to that in our process the waste is quite high in general and that something we really need to work hard to get it down. But anyway we will always have some waste in process, it is not possible to avoid that totally and that is why it is really important to have partners or clients who are interested in buying the waste which we get from our processes. So yes it is really important.”

From the above comment of interviewee A it is easily understandable the importance of selling the salad waste to the third party. The company produce thousands of kilos of salad every day, in that case a huge amount of waste they get in the end of the working day. These waste increase the product cost for the company. In order to reduce the cost of the production the company is in need of partners who are interested in buying the salad waste.

Interviewee A also stated, “It’s important to measure it because otherwise we don’t have any control of the products total cost. When we calculate the cost price of a product before we offer it to our clients, we need to know what every component costs how much, and there the waste is one part, small part but anyway important part. So for instance if we know that we have waste in average about five percent then we take that in consideration to calculate the cost price.”

From the above discussion we can see how the waste management has a great economical impact on the company. It is not only important for the company to measure the waste accurately but also necessary to keep the record of daily waste. The company needs to know the approximate cost of each component before they offer the selling price to their customers. So undoubtedly keeping the record of waste is vital for the company.

3.1.2 Presenting interview with interviewee B

Interviewee B is one of the most experience work leaders form production department. This individual has a working experience of over nine years in Fresh servant. He shares his opinions on what he thinks about the management as well as handling of salad waste.

Theme 2: The second theme seeks to understand the effectiveness, advantages or disadvantages as well as the way to improve the waste management system in the production area. Interviewee B's response was, "We weigh the waste and we have a scale, before we put it in the bin and also it is quite hard to weigh because you have to lift every trash bin up on the scale. I would say some people do not always remember to weigh it so I do not know if the measurement is good. Well if we weigh everything it would be very effective but for me I do not think I can be there all the time to watch if people weigh everything!"

The interviewee explained the system workers follow to weigh the biodegradable waste in the production area. From his comment it is clear that the measurement process is performed manually; therefore there is a chance of missing or skipping the weight of salad waste unconsciously. If this happen very often there is chance to lose the track of measuring salad waste which can create a barrier for the company to calculate the production cost.

Interviewee B also mentioned, "It's a quite confusing system to me. It also interferes the daily work when you have to keep track of the waste every now and then."

From this comment it is very clear that the current biodegradable waste measurement system is not as effective as it should be. Since the workers are to perform this job beside their regular work at the same time it might make them to lose the track of their production related work.

When interviewee B was asked to share his ideas to upgrade the system his answer was, “The best thing would be if we did not have any waste. Now we have to estimate everything that we have to make for the salad. If we estimate wrong then either we have a lot of waste or we have to make more. If we would have the exact amount of products to be made directly from the morning we would not have so much waste. It would be much easier to calculate or make the list for production.”

The statement clearly tells us the amount of the waste also depends on the proper estimation and the right time.

He also stated, “The production is growing all the time and we have the waste disposal vacuum tube in the middle of the room where we are supposed to produce raw materials. Sometimes the tube is not working for some reason then we have five, six waste bins full of waste and then we have to wash raw materials next to the waste bin that might hamper the hygienic level. May be it has to be moved away in a different waste room close to the production where we should have another bigger tube connected to the waste disposal so we do not have to keep the waste bin inside the production room and we can weigh them after the production. Then we can get exact amount.”

By analyzing to his opinion, it seems the company is going to have a possible solution for the current problems related to waste management. Though the company needs resources to do according to interviewee B’s plan but once it is done there is a chance to create a better waste management that allows the company to generate the accurate amount of the biodegradable waste as well as to maintain a higher hygiene level.

Theme 3: This theme describes the impacts on common workers. When Interviewee B was asked about the impacts on workers his response was, “I don’t know if they are that interested. I think they try to follow the rules but I know by myself it’s not so often. One

waste bin weighs up to thirty-forty kilos and if three or four people forget that is few hundred kilos per day.”

The interviewee also said the work pressure might make the workers forget to measure the salad waste sometimes before throwing them into the bin.

3.1.3 Presenting interview with interviewee C

Interviewee C is a common worker of Fresh servant. She has a working experience of five years. The aim of interviewing this individual is to get to know what a regular worker's thought is on this matter.

Theme 4: The fourth theme seeks to understand the effectiveness of company's waste management from a worker's point of view. It is very important to consider the opinion of a worker who is giving his or her labor every day to the company. They also have keen knowledge about the matter since they are involved with the action directly.

When interviewee C was asked about the effectiveness of the current waste management of the company her response was, “I think it is not good because we throw too much salad. For example now our company is closed for two days and we are throwing about 700 kilos of salad waste just because it cannot hold the quality until next week. I think they should have checked it before how much salad they need to prepare for production.”

If the above comment is reviewed of interviewee C it can be seen that one of the reason the company generates too much salad as waste just because of over production. Though it is not easy task to calculate the exact amount of salad which needs to be produced but still if the company overproduce the salad anyway the amount of waste supposed to be high. If

the company gets too much waste they not only losing their money but also they are facing a big challenge to manage or to handle the salad waste.

When the researcher discussed with interviewee C about some changes that could be helpful for the company to control waste her response was, “They can teach people for example some people when they cut paprika (capsicum) they throw away half of it and some people have been schooled they cut and throw away what necessary to throw. And it has not been really any schooling or training, they just take people and explain how a cucumber looks like how a capsicum looks like and just throw the part u kind of do not use.”

Interviewee C also added, “Our consultant from Holland he came one day and I was the only person at my working position. He told me how much to cut off a cucumber. He said it really does matter if you cut a big peace or small piece from a cucumber because that is also money and that is also eatable. You do not need to cut for example five centimeter of the cucumber when you can cut only one centimeter. “

From this statement it seems what is causing the company to get more and more salad as waste is some of the workers inaccurate way of doing their job. Workers need to be more trained in order to do their job perfectly.

Theme 5: Under this theme the researcher has discussed about the effects on human body during handling of waste. Interviewee C’s response was, “Well it is not good obviously. I think the problem is measuring the waste is done here manually so it does not have good effect on human body.”

From the above comment it is easily understandable the current procedure of measuring and handling of waste does not have good effect on human body as well as this might cause greater physical problem for common workers.

3.2 Observation

While doing the research work the researcher had chance to observe the production area specially the Big Kitchen where the collected salad waste are brought to weigh as well as dispose through the vacuum tube. The researcher noticed the place where the wastes are handled is one of the busiest places in the Big Kitchen. The reason is few different jobs are done at the same place. One of the salad washing machines and one of the drying machines are located right next to the waste vacuum tube. Also workers wash as well as dry processed salad at the same place. So there is rush almost always at that place. If some workers are engaged to wash or dry salads the other workers are to wait until they finish their job. As a result workers often skip to weigh waste during the busy working day. Moreover there is only one scale to weigh the dried salad and the waste of whole production area. So if there is too much salad waste to weigh the job takes long time to be done.

3.3 Validity and reliability

It is very important to consider the validity and reliability of a research when it is carried out. No research is exempted from the law of validity and reliability. Reliability is a term that refers to the extent to which assessments are consistent. For example if we talk about the reliability of a research it means if the research is conducted repeatedly, it will give the same result without any omissions. While on the other hand validity is a term that refers to the accuracy of an assessment. So reliability focuses on accuracy where validity focuses on the success of the research that the researcher seeks to measure. (Classroom assessment, 2014)

This quality research is considered as reliable due to the research was based on actual facts with the help of interviews who were professional in this field and interactions which were later on analyzed to come out with findings and recommendations. What makes this research more reliable is the interviewees answered the questions from their knowledge based on their working experience in Fresh servant.

On the other hand validity refers to the accuracy of an assessment, whether or not it measures what it is supposed to measure. (Classroom assessment, 2014). It is quite difficult to accomplish whether this research is valid or not since the researcher greatly relies on the response gotten from the interviewees. The research work has been carried out, analyzed, presented as well as findings and recommendation has been given, all these add more to its validity. Though only three persons have been interviewed, it is believed that their response does matter most to the result of this research.

3.4 Findings and recommendation

The purpose of this research work was to find out how effective the company's current biodegradable waste management process is as well as some recommendation to upgrade the system. Fresh servant is one of the large salad producing companies in Finland. Producing good quality of salad and selling it to their clients in a reasonable price is the main goal of the company. To do so a big company like Fresh servant is to focus as well as maintain some other minor issues as well. Handling and maintenance of the waste is one of those minor issues.

From the response that has been gotten from the research it can be widely deduced that though the waste is the small part but important part that contributes to the company's economy. Since this was a small research work and the researcher took the interview a very small group of people so it is quite challenging for the researcher to come up to a

conclusion. Analyzing the statements of the interviewees the researcher came to this conclusion that the management of waste in production area is not as effective as it should be. Some issues have been found reviewing the comments of the interviewees which should be brought out for the discussion as well as look for the proper solution. Keeping the fact in mind that Fresh servant is one of the fastest growing companies in salad business. It is a matter of fact the bigger the company will be the bigger the issues are going to be. So proper control at the right time can only help the company to prevent issues going out of control in the future.

Analyzing the interviews and presenting the findings on the basis of the analysis the researcher is trying come up with some suggestions and recommendations for company with the aim of developing the waste management of production area and. The authority can review these suggestions and recommendations in order to upgrade the current situation of the company.

One of the vital suggestions for the company is to arrange schooling or training courses for the employees from production department so they learn the exact way to cut as well as process salad and vegetables. The authority can divide the workers into small groups. One of the groups can attend course or training session at some specific time of the day while other groups continue their work for company. What if the workers get advanced training they know the value, cost and importance about the raw materials also they know exactly how to cut and process it. This will help the company to reduce the amount of waste from production area moreover maximize the usage of raw materials.

Another suggestion is to raise awareness among workers. Workers must know why is it important to weigh the waste accurately and keep the record of it. They should also know how it affects the company economically, what are the costs as well as the value of it. This will raise the awareness among them and make the workers more careful.

The authority can reposition or make some changes in the place where the waste is weighed before disposed through the vacuum tube. For example they can reposition the salad washing machine and dryer and create more space so that the handling of salad waste can be easier and well maintained. This will also help to reduce the rush at that place. One or two more scales need to be added in Big Kitchen in order to weigh the waste as well as processed salad.

In future when the company will have enough resources they can build a separate room for handling the salad waste. The vacuum tube for disposing salad should be moved from the Big Kitchen to that room or another pipeline should be made that is connected to the main tube. All the wastes from production area should be collected and sent to that particular room. At the end of the working day the shift leader can send one or two workers to weigh the wastes as well as dispose through the vacuum tube. If this can be done it is possible for the company to keep the exact record of wastes. In addition a better hygiene can be maintained.

The shift leaders or the people who are responsible to estimate the amount of salad need to produce for the day should be more careful. Especially before public holidays if there is too much salad is produced than what necessary that will cause more wastes.

4 Conclusion

Oy Fresh Servant Ab is an innovative family-owned company in the city of Pietarsaari. The company produces thousands of kilos of salad everyday so the waste from the raw material is quite high. It is very important for the company to keep records of food as well as salad waste in a proper way. The aim of this research was to focus on the management and handling of biodegradable waste in the production area.

Due to high production the company generates considerable amount of food and salad waste. This generated waste is sold to a few partner companies who are interested in buying biodegradable waste. After doing the research the result is clear. The research part was very challenging and it was a great challenge for the researcher to find out proper solutions.

This thesis has been very enlightening and a great accomplishment to the researcher. While working on this thesis it provided the writer joy and cherish. The researcher has been working in the production department of Fresh Servant Oy Ab for three years and this is where the motivation for this work came from. The researcher believes that he learnt a great deal of so many new things while doing this research work, knew small things that carries great values.

This research work brought into the researcher's attention of those things that he did not think of himself before. As It has been mentioned above the waste is a small part but a very important part that contributes to the company's economy. Therefore the authority should be taking care well of it. After analyzing the interviews and observing the situation from very close, the researcher thinks the company needs to concentrate more on handling of waste in production department. It took him couple of months of thinking, planning as well as hard labor to accomplish this research work. Hopefully the company finds this

research work helpful for them and review the recommendation in order to solve the current issues regarding company's waste management system.

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Theme 1. Economic impact

1. How important is it to sell the salad wastes to the third party?
2. Why is it important to measure the weight of salad waste accurately before putting them in garbage bin?
3. Why is it important for the company to keep the record of salad waste which is collected from the production area?
4. Which way the salad waste can be useful?
5. What are the economic impacts of the general waste management process on the company?

Theme 2. Waste management

1. How many years of working experience do you have in Fresh Servant?
2. Which process is currently followed to measure the weight of salad waste?
3. How effective the current process in your opinion?
4. What are the positive and what are the negative impacts does this process have?
5. What are the chances to upgrade this measurement process in your opinion and how?

Theme 3. Impacts on workers

1. What workers think about the measurement process and how do they react?
2. Are the workers able to follow the process right way?
3. Does the work pressure make the workers forget to measure the salad waste sometimes before throwing them into the bin?

Theme 4. Effectiveness

1. How effective the current system of waste management in production area in your opinion?
2. How difficult is it to measure the salad waste and keep the record every single time before throwing them in the garbage bin?
3. How important it is to bring some changes in the current process?

4. Please describe the advantages and disadvantages of the current waste measurement process.
5. What are your ideas for the betterment of this process?

Theme 5. Physical stability

1. How the waste measurement processes affect the human body?
2. What kind of experience did you gain during performing this job?

The answers will be analyzed as well as discussed to find out the effectiveness of the current waste measurement system in production area.