

Assessment Available Meat Packaging Materials and Their Challenges at Ethiopian Private Abattoirs

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How to cite this paper: Addis Fikrie Birhanu. (2022) Assessment Available Meat Packaging Materials and Their Challenges at Ethiopian Private Abattoirs. *International Journal of Food Science and Agriculture*, 6(3), 343-348.
DOI: 10.26855/ijfsa.2022.09.016

Received: July 13, 2022

Accepted: August 10, 2022

Published: September 21, 2022

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Abstract

Packaging had a great role in product protection, identification, promotion and convenience, and extend product shelf life. The most common materials for meat packaging were plastic or synthetic material. Primary data were collected through interview and observation where as secondary data were collected by reviewing literature to assess available meat packaging materials. Stocknet, cartoon, vacuum pack or criobag, bone guard plastic were used by private export abattoirs for export market based on type of product while normal poly bag and plastic roll or sheets were used for domestic market. High domestic price of stocknet, poor quality of domestic stocknet, unavailability vacuum packaging plastic as required, change in price of plastic materials were the most challenge raised by meat producers and exporters. Characterization of plastic packaging materials should be used in order to identify specific plastic package, and Proper storage these materials should be applied in order to reduce contamination of the meat product which had a great impact on health.

Keywords

Meat, Packaging materials, Challenge, Private abattoirs

1. Introduction

Packaging is the science, art and technology of enclosing or protecting products for distribution, storage, sale, and use. Packaging is one area that has attracted attention because the use of suitable materials for food products may improve their shelf life and contribute to wholesomeness [1]. The role of food packaging is being increasingly recognized, as it has multiple functions such as product protection, identification, promotion and convenience, and is very important in increasing product shelf life by retarding quality degradation and ensuring safety [2].

The principal roles of Meat packaging are to protect meat product from outside influences and damage, to contain the meat and to provide consumers with ingredient and nutritional information. More over packaging is to protect meat and meat products from undesirable impacts on quality including microbiological and physio-chemical alterations. Packaging protects meat during processing, storage and distribution from: contamination by dirt, contamination by micro-organisms, contamination by parasites, contamination by toxic substances, influences affecting colour, smell and taste, loss or uptake of moisture [3, 4].

There are different packaging materials available nowadays in the world. Among these Flexible packaging materials (Plastic films, Paper, Aluminium foil), Semi-rigid packaging materials (Paperboard/cardboard/containers, PET, and PVC containers, Aluminium containers, Molded containers) and Rigid packaging containers (Glass containers, Metal cans, Fibre board containers, Wooden boxes/crates/barrels) were classified based on their hardness. The most common

materials for meat packaging were plastic or synthetic materials such as Polyethylene (PE) Polypropylene (PP), Polyvinyl chloride (PVC), Polyester (PET), Polyamide (PA), Polyvinylidene chloride (PVDC) and Ethylene vinyl alcohol (EVOH): [5].

Use of plastics for food packaging applications is increasing both in quantum as well as in variety. Plastics are available in various forms such as monofilms, co-extruded films, laminates, sachets, jars, bottles, jerry cans, trays, cups and containers of all shapes and sizes. These Packaging materials are known as possible source of microbial contamination of food. Since food eaten has a direct influence on health, it is therefore important that manufacturer and food handlers keep food safe, especially from harmful hazards. There was no documented information on the packaging materials used in Ethiopian private meat Industry. Therefore, this manuscript provides a high light of packaging materials used at private abattoirs and their constraints.

2. Methodology

The data were collected from eight private export abattoirs and one local meat processing plant purposively. Due to business related issue the name of abattoirs were not mentioned & represented by letters. Primary data were collected through interview and observation. For this purpose a formal well-structured questionnaire was prepared and each plant manager was interviewed on available meat packaging materials, purpose, source and their challenges. Data on packaging machine used for manufacture of plastic package, printing machine for plastic package and type of packaging machine were collected through personal observation. Other secondary data were collected by reviewing Books and Journals.

3. Result and Discussion

3.1. Available meat packaging at export abattoirs

The packaging materials used at export abattoirs for export market are stocknet, cartoon, vacuum pack/air sealed bag/criobag, bone guard plastic while plastic bag or normal poly bag, plastic roll or sheet used for domestic market. Multivac north Africa SARL packaging film (Black colour)-multivac used at one local meat processing abattoirs (H) (Table 1). All most all export abattoirs (Except H) use stocknet as packaging materials for export of chilled chevon and mutton carcass to United Arab Emirate (Dubai) and Saudi Arabia. The price of purchase and source of the stocknet was different for each abattoir. Export Abattoir A, B, & G stocknet source was from foreign market China and Pakistan-Tanzania Textile factory respectively (Fig. 1) while other export abattoirs (C, D, E, F and I) is from domestic market-Al-mehdi Industry plc (Fig. 2). Stocknet imported export abattoirs rely on domestic source in case of scarcity due to shipment delay. Export abattoir A and G were used normal plastic bag for packing of red offals, and normal poly bag and plastic roll for Beef vacuum packing to supply for domestic market by purchasing the materials from Tamra Plastic company, and SL packaging and 7E packaging company respectively. Similarly, Export abattoir B also used normal poly bag to pack red offals for domestic market.

Vacuum bag packaging material was used at both A and B export abattoirs to pack frozen beef which is on the trial to supply for export market. Both of the abattoirs had Automatic vacuum packaging machine for this purpose. The source of these materials was Mauritania for (A) abattoir and Kenya for (B) abattoir. Similarly, Abattoir G applied crio bag plastic materials which imported from Hind to pack deboned Beef for export market. This abattoir is the sole export abattoirs that installed packaging machine for manufacturing of plastic package (Fig. 3) and printing machine to print necessary information on plastic package (Fig. 4). To make these plastic materials, raw materials (monomers) were imported from abroad (Fig. 5).

Abattoir H was the only local meat processing plant which has multivac machine (Fig. 6) and Automatic vacuum packaging machine (Fig. 7) for packaging of Beef, Lamb, and Chicken and Pork products to deliver for the local market. For this purpose Multivac north Africa SARL (white in colour) and packaging film (Black in colour)-multivac of different size were imported from Jarman. The Automatic vacuum packaging machine packed the product by removing inside air from plastic materials, not made a shape and not computerized in contrast to multivac machine.

Cartoon used as secondary packaging for handling raw materials, red offals and carcass cut at Export abattoirs B were imported from foreign country (China & Hind) while in case of abattoir H Source were from domestic manufacture of packaging company (SL packaging and 7E packaging company). Similarly, local Abattoir H were use cartoon to pack mass of beef, pork & chicken product to supply for the domestic market and it was obtained from domestic source unlimited packaging company. However, Export Abattor C had its own source Sister company (Blue Nile PP & Craft Paper Bag Manufacturing company) for manufacturing and supplying of plastic package (normal poly bag, plastic sheet or plastic roll) and cartoons.

Table 1. Packaging material, purpose and sources at export abattoirs

Name of Abattoirs	packaging material	Purpose	Source
A	Stocknet	Chilled chevon and mutton carcass export	Foreign (china) ,domestic (Almedhin) in case of scarcity
	Normal plastic bag & cartoon	red offal packing	Domestic (Tamra Plasric company)
	Normal poly bag and plastic roll	Beef vacuum packing for domestic market	Domestic (Tamra plastic company)
	Open top clear plastic vaccum bag	Trial frozen beef vacuum packing for export market	Foreign (moritania)
B	Stocknet	Chilled chevon and mutton carcass export	Foreign (Pakistan Tanzania Textile factory)
	Normal poly bag	Red offal packaging	Domestic
	Vacuum pack/air sealed bag /criobag	Packing of frozen beef cut (boneless) for export	Foreign(Kenya)
	Cartoon	Secondary packaging for raw materials, red offals & cut carcass	Foreign (China & Hind)
C	Bone guard plastic	Packing of bone in meat	Domestic (local)
	Stocknet	Chilled chevon and mutton carcass export	Domestic (Al-mehdi Industry plc)
	plastic sheet	wrap of Beef carcass for domestic market	Domestic (blue Nile company)
D	Stocknet	Chilled chevon and mutton carcass export	Domestic (Al-mehdi Industry plc)
E	Stocknet	Chilled chevon and mutton carcass export	Domestic (Al-mehdi Industry plc)
F	Stocknet	Chilled chevon and mutton carcass export	Domestic (Al-mehdin Industry plc)
	Stocknet	Chilled chevon and mutton carcass	Foreign (pakistan)
	Crio bag	Vaccum packing of deboned beef	Foreign (Hind)
	Normal poly bag	Red offal packaging	Domestic (SL and 7E packaging company)
G	Cartoon	Secodary packing for offals sells , raw material reciving and carcass cut	domestic (SL packaging and 7E packaging company)
	Multivac north Africa SARL	Packing of beef, pork & chicken for domestic market	Foreign (German)
	Packaging film (Black) –multivac	Packing of beef ,pork & chicken for domestic market	Foreign (German)
H	Cartoon	secondary packaging for beef, pork & chicken for domestic market	Domestic (Unlittited packaging company)
	Stocknet	Chilled chevon and mutton carcass export	Domestic (Al-mehdin Industry plc)
I	Stocknet	Chilled chevon and mutton carcass export	Domestic (Al-mehdin Industry plc)



Figure 1. Stocknet imported from abroad.



Figure 2. Stocknet manufactured in domestic (Al-mehdin).



Figure 3. Packaging machine for manufacturing plastic pack.



Figure 4. Printing machine for printing necessary information on plastic materials.



Figure 5. Raw materials imported from abroad for preparing plastic packaging film.



Figure 6. Multivac machine used by Abattoir H.



Figure 7. Automatic vacuum packaging machine.

3.2. Challenge raised by export abattoirs in relation meat packaging

- a) Unavailability of stocknet and meat plastic packaging as required.
- b) High domestic price of stocknet and poor in quality.
- c) Shortage of containers to import vacuum plastic packaging and shipment delay.
- d) Skills and Knowledge gap in meat vacuum packaging.
- e) Change in price of plastic materials.
- f) Inadequate metal can for processed meat.

3.3. Proposed solution for the challenges

- Expand stocknet and plastic package manufacturing Industries for meat company and improve their quality as per international standard.
- Expand private shipping and logistic service provider, break monopoly service and strength Ethiopian Shipping and logistic Service Enterprise, and improve customs service quality.
- Build the capacity of meat producers and exporters on vacuum packaging technology and its operation in collaboration with non-governmental organization.
- Solve the challenge of metal can manufacturer and provide incentive for imported raw materials.

4. Conclusion and recommendation.

Stocknet, cartoon, vacuum pack or criobag, bone guard plastic, normal poly bag and plastic roll or sheet were available packaging materials used at private export abattoirs either for foreign or domestic market based on the nature of product and customer needs. All most all Export abattoirs were used stocknet for exporting of chilled chevon and mutton carcass even though its pice, size and source were different. Some of export abattoirs were used vacuum pack or criobag, bone guard plastic for packaging of frozen beef which is on trail to supply for the export market and were imported from different country. Cartoons were used as bulk packaging for Packing of red offals, beef, pork, chicken and raw materials. Hence, it needs to characterize plastic packaging materials used to identify specific plastic package, and provide practical training how to operate vacuum packaging machine to avoid product defect and proper storage of these packaging should be applied in order to reduce contamination of the meat product which had a great impact on health.

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