

Education on the First in First Out Method on Storing Animal Product in the Refrigerator

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ABSTRACT

Animal products are products that are easily damaged. One alternative to maintain shelf life is to store in the refrigerator. The aim of this activity is to provide education to housewives regarding handling the storage of animal products in refrigerator using the FIFO (First In First Out) is a food storage system where the first ingredients enter the refrigerator, the items will be taken out first if they are used. This activity was carried out for 30 household in South Arut District, West Kotawaringin Regency, Pangkalan Bun via Zoom meeting with parameter FIFO : implementation of food entry and exit, packaging use, separation of raw and processed foods. Descriptive data processing by SPSS shows that 54,44% of housewives have implemented the FIFO method and 45,56% have not implemented the FIFO method. Through education activities, it is hoped that housewives will be able to better understand and change habits in storing animal products in the refrigerator, especially using FIFO method.

KEYWORDS

animal; methode; products; FIFO; refrigerator

1. INTRODUCTION

Shelf life item for consumer is the length of time some time recently the nourishment is considered unacceptable for human utilization. In any case, shelf life can similarly be given as the length of time a nourishment item can be put away and shown keeping up an satisfactory quality or particular functionality. First is for items which may lose quality and second about products which are not secure after the date or in the event that put away not accurately. A attainable method for initial temporary preservation of the insects in most cases is deepfreezing. When choosing a freezing method, it is important, to decrease the temperature and freeze the insects as quickly as possible (shock freezing) for shelf-life reasons as with any other food or raw biological material. Essentially, as any food or biological material insects contain microscopic organisms, other organism and parasites. Guaranteeing nourishment security is fundamental for keeping up great wellbeing and anticipating foodborne illnesses. Whether you're cooking at domestic, eating out, or basic need shopping, following proper food safety practices is essential. One of the simplest yet most effective ways to prevent the spread of harmful bacteria is by First In First Out (FIFO) completely some time recently taking care of nourishment.

Ingredients, raw materials, and insect meant for food usage must be kept at the temperature determined by the food processor in charge of producing them. The first in – First Out (FIFO) concept should guide storage management. Any material that needs to be kept cold must be put in a cold environment as soon as possible. Completed goods need to be properly handled, kept, and identified. FIFO concept must be followed while placing completed goods in the warehouse.

Food waste is a serious problem in Indonesia, especially in Central Kalimantan's West Kotawaringin. Although there is a lack of specific data for West Kotawaringin, overall figures show that Indonesia produces about 20,93 million tonnes of food waste a year, making it the largest producer in South Asia. This corresponds to 300 kg annually on average per person nationwide. Food waste is the most noticeable category in Indonesia, accounting for almost 41,5% of all garbage. Restaurant, catering services, and home garbage are the main sources of this waste. The need to minimize food waste is becoming more and more apparent to local government and groups. Although the data supplied does not provide specific numbers for the West Kotawaringin, the pattern noted at the national level suggests that similar challenges exist from both local authorities and community members.

When we forget the date of food, it can lead to food waste. Many homes do not consider the impact of keeping a lot of food in the refrigerator for an extended period of time without a proper management system regarding the first and last food entrance into the refrigerator. Edible or consumable food that thrown out before or after its expiration date is considered food waste (Emilie Wieben, 2017). According to Hidayat et al. (2020), food waste is divided into two categories: avoidable food waste (kitchen leftovers) and unavoidable food waste (consumer food waste). At the consuming stage, food waste can happen in a variety of setting and at different levels, such as homes, traditional marketplaces, public institutions like hospitals and school, and commercial spaces like dining establishment and shopping centers (Mulyo et al., 2022). Because households contribute substantially to food waste, addressing this issue must begin at the household level. First in First Out Method implemented at the household level, is one strategy for managed food safety and reducing food waste.

2. METHODOLOGY

This activity was carried out for minimum respondent ie 30 household in South Arut District, West Kotawaringin Regency in 2020 year. Respondents were selected by purpose sampling. We conducted a preliminary survey to select respondents with the following criteria: frequent purchase of animal products, having refrigerator at home and storing animal products in the refrigerator. Data collection is done via google form, where respondents fill in questions on the google form link. Socialization is done through education in xoom meeting. After socializing the presentation of material regaring FIFO, participants filled out questionnaire questions via google form. The FIFO parameters as are folows: implementation of food entry and exit, packaging use, separation of raw and processed foods. This study only examines the potret and description of the application of FIFO in tne community and the level of habit of doing FIFO in the community. The education process is caried out using zoom. Data were analyzed using Excel and SPSS.

3. RESULTS AND DISCUSSION

According to Sun et al. (2021), food waste is defined as edible or unfot for human consumption that has been thrown out after its expiration date, stored afetr its quality has diminished, or left to deteriorate or be eaten by insects. Therefore, a weel - regulated process of converting trash into human or animal feed is necessaryto ensure that the value added product is safe and secure for consumption. Without a doubt, reducing food waste is a significant problem that affects a lot of people (Cappelletti et al., 2022).

Nourishment squander can happen at any point along the supply chain, including during agricultural generation, post harvest taking care of and exchange, habdling, the foodservicesector, retailers and family units. The strategy is planned to be iterarde to guareantee that individuals are mindful of the esteem and preferences of swuander administration within the industry. The most objective is to propel the industry to diminish mechanical squander (Blanke, 2015). Getting accustomed to purchasing, preparing and eating food in moderation - rather than in excess, which could lead to it being thrown away as waste - is one of the issues that should be encouraged. Develop to practice of using the First In First Out (FIFO) or First Expire First Out (FEFO) concept, which states that food that is kept in storage or that is nearing expirition should be used or eaten first (Akbar, 2020).

Many regulatory jurisdictions are already conducting risk-based inspections using HACCP principles and other innovative approaches, include FIFO - First In First Out method. This manual is based on experience gained from many of these approaches, and for the regulatory food safety professional can enhance the effectiveness of the inspections by incorporating a risk-based approach

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Table 1. General Description of Respondents

Parameter	N	(%)
Gender :		
Man	4	13,33%
Woman	26	86,67%
Age :		
<30 years	4	13,33%
30-50 years	26	86,67%
Last Education :		
Junior High School	1	3,33%
Senior High School	14	46,67%
S1	12	40,00%
S2	3	10,00%

Table 2. Application FIFO Parameter

Parameter	True (N)	%	False (N)	%
Implementation of food entry and exit	15	50	15	50
Packaging use	21	70	9	30
Separation of raw and processed foods	13	43,33	17	56,67
Average Value	16,33	54,44	13,67	45,56

Table 3. Behavioral Level for FIFO

Parameter	N	%
Good	6	20
Enough	17	56,67
Not enough	7	23,33

Table 4. Corelate General Description of Respondent with Behavioral Level

Parameter	Sig
Gender	0,534
Age	0.037*
Last education	0,487

The FIFO method usually use for the meat in the refrigerator for the household scale as an example : check food labels for information on storage, handling, and expiry dates. Use the "First In, First Out" (FIFO) method when the household safe the meat in the refrigerator to ensure that older items are used first. Discard any expired or spoiled foods promptly to prevent consumption of contaminated products. It because when household shopping, they usually select perishable items last and keep them separated from other groceries (Kour, 2024). Many household usually keep in the refrigerator before they cook it. From the result showed that 54,44% of housewives have implemented the FIFO method and 45,56% have not implemented the FIFO method. There are not corelate between gender and last education with behavioral ($P>0,05$), but it significant ($P<0,05$) for age. Based on the result, it is known that very few respondents are familiar with the term of FIFO. Respondent also do not yet understand the negative impact of consumption behaviour that tends to leave food uneaten, leading to the waste. Educational effortas are needed to encourage changes ni community consumption behaviour to become more wise and more caring (Akbar, 2020).

There are two methods or procedure about saving food are First In First Out (FIFO) or Last In Last Out (LIFO). FIFO system is a storage system goods are carried out using the good that come in first system, which is also issued first (Agustiar & Mandasari, 2020). FIFO (First In First Out) method to lesson the chance of easy left and damaged materials. Every materials has experied date (Nicole Setiawan & Ellitan, 2023). FIFO as the active managerial control is used extensively throughout this manual to describe industry's responsibility for developing and implementing food safety management systems to reduce the occurrence of foodborne illness risk factors. Although the term may be new to some, the basic management principles are probably already being used in the day-to-day operations of most of the establishments you regulate. FIFO means the purposeful incorporation of specific actions or procedures by industry management into the operation of their business to attain control over foodborne illness risk factors. It embodies a preventive rather than reactive approach to food safety through a continuous system of monitoring and verification. FIFO as the food safety of HACCP principles used for controlling risk factors that directly contribute to foodborne illness. Within the retail and food service industries, the implementation of these science-based food safety management principles varies especially for the food which kept in the refrigerator.

A technique for arranging, storing and maintaining both dry and wet food items, as well as documenting their reports, could be called food storage. After the received food ingredients must be promptly transported to the capacity room, distribution center, or refrigerated room after they satisfy the requirements. After the food is delivered and consumed, the nutrition capacity is used. The primary in to begin with out (FIFO) and Primary lapsed to begin with out (FEFO) guidelines must be adhered to by capacity, which means that food item that are first sorage and those that are about to expire should be used. When food ingredients are stored properly, thwy will last longer and be more resilient to damage.

Storage must adhere to the First In First Out (FIFO) and First Expired First Out (FEFO) principles, meaning that food items that are stored first and those that are nearing their expiration date should be utilized/used first. Storing food ingredients using the correct procedures will make them last longer and withstand damage. On the contrary, storing food improperly can cause perishable and rotten materials. What is meant by proper storage includes, among other things, the type and appropriate storage equipment, the temperature that should be applied, the method of arranging and placing items, the tools or containers for the items, the cleanliness of the storage equipment, the sealing or wrapping of the materials, and the organization of the items to be stored (Bakri, 2018).

From the table 2 about application FIFO parameter, respondents in this study had applied the FIFO method to keep animal food (beef, chicken, fish), that way there are no items long wasted due to damage, and they undertand about the function FIFO system is to minimize loss of quality of goods in the warehouse the items stored will not be stored later experienced damage due to good stored for so long (Hadinata & Adriyanto, 2020). This FIFO flows is the flow of goods expenditure be organized and controlled. Application FIFO parameter about implementation of food entry and exit, as many as 50% respondent have implemented it, and understood that using this method then storage rotation occurs and expenditure on food supplies based on prior acceptance. Previously placed at the front or at the top from its storage place. In process these expences take precedence foodstuff recieved first formerly. Incoming food ingredients will be used first previously also in according with the FIFO principle. However, they do not use monitoring standards, for example marking tha data of entry, to make checking easier; but only based on memory regarding food items that have been enterd first. This is because on household scale, the number of food items coming in and out is not very large, so they are easy to recognize and remember. However, it hoped that respondents will be able to mark the item's entry date

on the refrigerator, making it easier to check and monitor whether the product is still good or damaged. A person's memory is easy to forget. To avoid this, it is best to use signs related to the date the goods were entered. Especially for animal materials, which are susceptible to damage. Animal foods are easily damaged due to uncontrolled storage and this causes food to be thrown away. On an industrial scale, supervision or control food items are carried out using item cards or bin cards i.e. card to record the number of incoming and outgoing food items as well as the remainder and the date they were cooked (Andika, 2022).

In terms of packaging parameters, as many as 70% have carried out closed packaging of food ingredients before putting them in the refrigerator; and 30% have not used closed packaging. Respondents who have not used closed packaging mostly use simple plastic bags to cover beef, chicken, or fish in the refrigerator. Storage using closed packaging on a household scale is very important because many households store animal products in the refrigerator and are not grouped according to the group of animal ingredients, so it can cause damage to food, like contamination with other animal ingredients. Household scale storage generally stores various types of animal food. Storage areas that are not closed and adequate will make it difficult for someone to collect using the FIFO method because they are generally piled up (Sucipto, 2015). With food ingredients and a place to store ingredients appropriate then will be able to guarantee that the food ingredients become more durable according to the durability of each material food.

The last, application FIFO parameter about separation of raw and processed food, 43,33% respondents had separated raw materials from processed materials and 56,67% have not separated raw and processed food ingredients. In the refrigerator, there are dry and wet food; and it is important to know its water content as ingredient foods. The placement of food ingredients to be processed must be stored in the place where the material should be stored so that it does not affect other food ingredients. If the food ingredients are not stored in the appropriate place, so it will affect the taste or colour, and even the appearance of the food, so it making the food become less quality. As we already know that raw material food is categorized into perishable food ingredients, and it is easily damaged and must be stored in the refrigerator or freezer and must not be mixed with ready-made processed ingredients, with the aim of slowing down damage occurs.

4. CONCLUSION

Result of this research that 54,55% of housewives have implemented the FIFO method and 45,56% have not implemented the FIFO method. Through education activities, it is hoped that housewives will be able to better understand and change habits in storing animal products in the refrigerator, especially using FIFO method.

REFERENCES

- Agustiar, & Mandasari, Y. (2020). Penerapan Sistem First In First Out terhadap Bahan Pangan Basah di Dapur Best Western Premier Panbil Hotel Batam. *Jurnal Pariwisata Bunda*, 1(1), 18-29.
- Akbar, I. (2020). *DPPH Kalbar Kampanyekan Food Loss and Food Waste*. Pontianak Post. <https://pontianakpost.jawapos.com/metropolis/1462717848/dppkh-kalbar-kampanyekan-food-loss-dan-food-waste>
- Andika, I. P. R. M. (2022). Penerapan metode first in first out (fif) pada bahan makanan di hotel fairfield by marriot bali legian. *Jurnal Ilmiah Pariwisata Dan Bisnis*, 1(5), 1065-1080. <https://doi.org/10.22334/paris.v1i5.75>

- Bakri, B. (2018). *Sistem Penyelenggaraan Makanan Institusi*. Ajar Gizi Edisi.
- Blanke, M. (2015). Challenges of Reducing Fresh Produce Waste in Europe—From Farm to Fork. *Agriculture (Switzerland)*, 5(3), 389–399. <https://doi.org/10.3390/agriculture5030389>
- Cappelletti, F., Papetti, A., Rossi, M., & Germani, M. (2022). Smart strategies for household food waste management. *Procedia Computer Science*, 200(2019), 887–895. <https://doi.org/10.1016/j.procs.2022.01.286>
- Emilie Wieben. (2017). Food loss and waste and the linkage to global ecosystems. *International Nut and Dried Fruit Council, July*, 26–27. <http://www.fao.org/save-food/news-and-multimedia/news/news-details/en/c/1026569/>
- Hadinata, S. T., & Adriyanto, H. (2020). Tinjauan Penyimpanan Sistem Fifo Pada Bahan Hewani Yang Berdampak Pada Proses Pengolahan Makanan Di Morrissey Hotel Jakarta. *Emerging Markets : Business and Management Studies Journal*, 6(2), 103–109. <https://doi.org/10.33555/ijembm.v6i2.100>
- Hidayat, S. I., Ardhanay, Y. H., & Nurhadi, E. (2020). Kajian Food Waste untuk Mendukung Ketahanan Pangan. *Agriekonomika*, 9(2), 171–182. <https://doi.org/10.21107/agriekonomika.v9i2.8787>
- Kour, S. (2024). *How to ensure food safety : Tips and best practices for consumers*. 15(3), 1–2.
- Mulyo, J. H., Sugiyarto, S., Perwitasari, H., Widada, A. W., Rohmah, F., & Ardhi, M. K. (2022). Food Consumption Management in Urban Households in Indonesia. *Agriekonomika*, 11(1), 55–61. <https://doi.org/10.21107/agriekonomika.v11i1.12502>
- Nicole Setiawan, V., & Ellitan, L. (2023). Supply Chain Management and Supply Chain Performace: The Case of Mcdonald's. *Jurnal Ilmiah Multidisiplin*, 2(3), 2023.
- Sucipto, D. C. (2015). *Keamanan Pangan Untuk Kesehatan Manusia*. Gosyen.
- Sun, W., Shahrajabian, M. H., & Cheng, Q. (2021). Organic waste utilization and urban food waste composting strategies in china-a review. *Notulae Scientia Biologicae*, 13(2), 1–16. <https://doi.org/10.15835/nsb13210881>