The Development of the Fresh Fish Supplay Chain Incoporated Small Scale Retailers at Denpasar City.

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This research is the initial step of the development of fresh fish ABSTRACT. supply chain model at Denpasar City. The objective of this research are (1) to identify the consumers behavior in purchasing of fresh fish, and (2) to review the existing condition of the fish supply chain system including the structure, handling procedure and performance achievement. The results showed that both working women and not working women were more concerned with the attributes of fish conditions compared to habitat or species fish attributes with the average frequency of purchasing fresh fish 4-8 times per month. Lower frequency in purchasing fresh fish due to lack of purchasing access until at their home location. By using the Analytical Hierarchy Process (AHP) method it was known that the existing supply chain system it doesn't work to distribute the proportional value added among the actors. The actors in the downstream chain get the smallest added value. Further analysis showed that the score of their performance in term of reliability (0.276), responsiveness (0.299), and agility (0.238) and cost effectively (0.238). The reliability indicated by the perfect order fulfillment (0.40), product quality (0.38) and process quality (0.22). The responsiveness indicated by the order fulfillment time cycle (0.89) and product delay (0.11). The agility indicated by the upstream supply chain flexibility (0.34), upstream adaptation ability (0.43) and downstream adaptability (0.23). The performance in term of the cost effectively indicated by cost distribution in production activity (0.53), distribution activity (0.30) and after sale activity (0.17).

Keywords: integrated supply chain, small-scale enterprises, fresh fish, urban consumer

INTRODUCTION

The development of the fresh fish supply chain at Denpasar City is very necessary for improving the purchasing access of the urban household consumers. The level of the fish consumption per capita in Denpasar City is lower than national fish per capita consumption average. Lower in fish consumption per capita at Denpasar City is not due to a lack of purchasing power but due to a lack of purchasing access. In other side, recently it was found that existing of the mobile retailers tend to increase from day to day as part of the informal economy sector. The local government should be put more attention to give the solution to bring them in become more professional. By this consideration, it is necessary to develop a model of marketing fresh fish that can incorporate small-scale retailers in the downstream chain to bring fresh fish until at the home location.

Paper presented on International Conference on Science, Technology and Humanities (ICoSTH), LPPM, Udayana University Kuta-Bali 22-23 Ocotober 2018 Like other perishable foods, freshness and quality are the two most important factors in raw fish. After harvest, there are pronounced changes in the appearance, texture and chemistry. In postmortem muscle, the degradation of ATP to DP, AMP and IMP usually takes place within 24 hours or less. The rate of quality deterioration in fish is usually associated with improper harvesting, handling, storage or preparation. The activity of microorganism is the main factor limiting the shelf life of raw sea food. Microorganism is found on all the outer surfaces and inside of the fish body. The change of the quality of the fish freshness that will occur along distribution chain in terms of microbiological, biochemical, proximate composition and sensory.

Several studies reported that seafood is very susceptible to contamination throughout the distribution chain. In Vietnam, during 2007-2013, seafood was the second highest of food safety compliances. The practices of fish distributors were also potential to be at high risk for contamination of raw fish. It was reported that approximately 42% raw fish in traditional market unacceptable according to microbiological standards. Recent years, consumers in Indonesia will become increasingly aware of food safety issue. Overtime these emerging consumers will become more demanding of food quality guarantees.

The application of cold chain in handling fishery products plays an important role in efforts to maintain the quality of raw fish. This is because the use of low temperatures is very good to inhibit the degradation process, because with low temperatures, microbial growth can be inhibited or can even kill microbes or bacteria. In addition, the use of low temperatures can also maintain freshness and nutrient content in fish. However, there are many obstacle was facing in implementing cold chain in Indonesia. Several researches reported that found several obstacles to cold chain implementation in Indonesian fisheries sector. There were (1) deficient professional skills, (2) lack of quality and safety-control measures, (3) high concentration of intermediaries, (4) poor infrastructure, (5) lack of information systems, (6) high cost of installation and operation, (7) deficiency of standardization, and (8) lack of government support for local businesses and social norms.

Base on several considerations above this research concerned with the development of the fresh fish supply chain at Denpasar City that can incorporate of the small-scale retailer. The objective of this research are (1) to identify the consumers behavior in purchasing of fresh fish, and (2) to review the existing condition of the fish supply chain system including the structure, handling procedure and performance achievement.

RESEARCH METHODOLOGY

Studiying the consumers behavior about perishable food requires a proper descripton of the overall situation of customers expectation and perceived quality that is available in the market place as a whole. Therefore, a descriptive research approach would be appropriate to explore the consumer behavior about perishable food. This study using *cross sectional* with survey methods. The respondents were working women and not-working women with the criteria of being married, were as a decesion maker of menus in the family, and purchased fresh fish in the past month. The preference in this study refers to the level of respondents' preference for various combinations of attributes of fresh fish. Preference measured by using scoring system with ten level of degree from score 1 to 10 at each combination of attributes that are proposed. Score 1, is the lowest score (dislike) and the highest score is 10 (very like). The attitude in this study refers to the actions of consumers that are influenced by feelings, knowledge or beliefs and behavioral habits. Attitude measured by using 5 level of Likert Scale, namely score 5 = strongly agree, 4 = agree, 3 = neutral or doubt, doubt, 2 = disagree, and score 1 = strongly disagree. Data analyzed by conjoint analysis to determine what combination of limited number of attributes is most influencal on respondent choice or decision making. The Fishbein model it was use to analyze of consumer attitude in purchasing of fresh fish.

In addition, a survey also done to explore about the existing condition of the fresh fish supply chain at Denpasar City. The survey was conducted in several locations, namely at the Gunung Agung Fish Auction Market, Kumbasari Market, Badung Market, Kreneng Market and several Village markets in Denpasar City. Business actors was interviewed included collectors, market traders, and retail traders. The number of respondents are 15 actors and selected using the snowball sampling method. The variables observed included three aspects, namely handling working procedures, the institutional and supply chain performance measured by several indicator such as reliability, responsiveness, agility and cost effectively. Data analyzed by using the analytical hierarchy process (AHP) method to capture both subjective and objective aspects of decesion. In addition, the AHP incorporates a useful technique for checking the consistency of the decision maker's evaluations, thus reducing the bias in the decision making process.

RESULTS AND DISCUSSION

Urban consumer behavior in purchasing fresh fish

Today's consumers not only want food product to be high quality, but also to meet health, safety and environmental attributes. As income increases, food consumption also change, and consumers become more demanding in term of quality and safety products. They also demanding consistency and value for their money. Hence, consumers in recent years have shown their high concern about safety, quality and health issue in case of choosing and consuming foods, more spesifically, perishable goods.

Fish are food that have advantages compared to other foodstuffs (Directorate General of PDSPKP, 2015). Fresh fish has an essential nutrient content that is very beneficial for health and intelligence, namely protein, carbohydrates, vitamins, minerals, and omega fatty acids 3,6 and 9. Based on the nutritional content and benefits of fish consumption it is important to continue to be carried out continuously to form culture of eating fish in the household. Efforts to increase fish consumption per capita have become the concern of the Indonesian government. Developed countries such as Japan and America also carry out various efforts to increase the population's fish consumption. Fisheries production potential in Indonesia should be able to increase fish consumption in Indonesia. However, the magnitude of Indonesia's fisheries potential is not as well followed by the high level of domestic fish

consumption. In 2014, the consumption of fish in Indonesia was 37.89 kg / capita / year (KKP, 2014). Karuniawati et al. (2017), reported that the level of fish consumption in Indonesia is still below compare to some countries, such as Japan 110 kg / capita / year, South Korea 85 kg / kg / capita / year, the United States at 80 kg / capita, Singapore 80 kg / capita / year, Hong Kong is 85 kg / capita / year, and Malaysia is 45 kg / capita / year.

Based on a study by the Directorate General of PDSPKP (2015), the causes of low fish consumption are a lack of continuous and quality fish supply, a lack of representative fish sales facilities, clean, and in accordance with consumer desires, an underdeveloped logistics system and distribution of fish capable of sending fresh fish to to the end of the consumer's residence. In addition, fish consumption between regions in Indonesia has not been evenly distributed where the Eastern Indonesia Region, which consists of regions in Sulawesi, Maluku and Papua, is known to have a higher fish consumption level compared to regions in Western Indonesia, especially Java.

Measurement of consumer preferences is very important because it is a basis for consumer interest in certain products and as a reference in developing programs that can increase consumer loyalty. Based on this, it can be said that the measurement of the level of consumer preference is related to the measurement of factors that form a consumer preference. According to Waysima et al. (2011a; 2011b), public attitudes toward fish are one of the determinants of factors that influence maternal behavior in providing fish as a family menu. Mother's affective attitude towards marine fish has a significant effect in increasing children's appreciation for consuming sea fish. Fish consumption is very beneficial and very good for mothers in fulfilling family nutrition. According to Salaa (2015), the role of housewives who work outside as breadwinners turns out to not leave their duties and responsibilities as a wife and a mother in their family so that the mother's behavior provides fish in the family menu based on the mother as a determinant of family menus (Sumarwan, 2014).

The conjoint analysis results show that working mothers and mothers not working in Denpasar City attach more importance to the attributes of fish conditions compared to habitat / species fish attributes. The difference in the results of the preference analysis between working mothers and non-working mothers lies in the relative importance (NRP) and the level of importance (HCV) as shown in Table 1.

Attributes to	maternal employment status	
	Working	Not- working
Value Interest (VI)		
Habitat / species:		
Bargain	-0.1845	-0.1944
Sea	0.1845	0.1944
Condition:		
Life	-0.1027	0.0850
Cleaned	0.4322	0.4505
Processed	-0.3712	-0.5451

Table 1. Distribution of respondents based on preference for fresh fish

Important Relative Value (IRP)			
Habitat / type			
Bargain	0= 961	05 056	
Marine	35,801	25,350	
Conditions			
Living	67,328	76,467	
Cleaned			
Processed			

The results of *Fishbein* analysis showed that working and not-working women have the same attitude of preferring fresh fish compared to processed fish. This can be seen from the average Fishbein analysis of attitudes toward fresh fish (working women = 67.2; not-working women = 59.5) which is higher than the average value of attitudes towards processed fish (working women = 34.8; not-working women = 28.5). Furthermore, the results of different t-test found there were no significant differences between attitudes towards fresh fish in working women and not-working women. However, a significant difference was shown between attitudes toward processed fish in working women and not-working women (p < 0.05), ie the attitude of working women to processed fish was higher in acceptance compared to not-working women.

The purchase of fresh fish and processed fish for working women and notworking women is calculated based on the frequency (per month) and quantity of fish purchases (per transaction). The results showed that almost half of working woen (42.3%) and not-working women (46.0%) bought fresh fish 4-8 times per month. Furthermore, the highest percentage of frequency of purchases of processed fish by working women (68.0%) and not-working women (61.0%) is less than four times per month. Based on the quantity, more than half of working and not-working women buy fresh fish as much as 1.0 to 1.2 kilograms. The results of the t-test analysis found that there were no significant differences in the frequency of purchasing fresh fish of working women and not-working processed fish between working women and not=working women. In general there is no significant difference between the quantity of purchases of fresh fish and processed fish both working women and not-working women.

The performance of the existing fresh fish supply chain in Denpasar City

Supply chain is the procedure of all parties occupied in fulfilling a customer request. The supply chain comprises the flow of all in order, products, resources and funds between the different stages of creating and selling a product. he supply chain includes all functions involved in receiving and filling a customer request. These functions include product development, marketing, operations, distribution, finance and customer service. A distribution channel is a chain of businesses or intermediaries through which a good or service passes until it reaches the end customer. It can comprise wholesalers, retailers, distributors and even the internet itself. Channels are broken into direct and indirect forms, with a "direct" channel allowing the customer to buy the good from the company, and an "indirect" channel allowing the consumer to buy the good from a wholesaler or retailer.

Fishery products are *perishable*, so that supply chain activities requires special attention (Catur Sarwantono et al., 2014). The supply chain channel has the task of distributing fish from suppliers to consumers. The length and shortness of the supply chain channel will determine the quality and safety of fresh fish during its distribution, costs and margins and *tracebility*. The supply chain channel describes the sequence of business institutions that are passed by a commodity since it is produced until it reaches the intended end consumer.

Based on interdepth interview to the several fresh fish supplay chain actors, it was found 5 types of channels for fresh fish supplay chain for urban households in Denpasar City (Figure 1). Based on figure 1, the characteristics of each type of supply chain channel are as follows:

- 1. Type one, generally carried out by traders whose wives work as retail traders. This type sells small size fresh fish commodities
- 2. Type two, fish suppliers sell their commodities through TPI (Fish Auction Place) Pasar Gunung Agung to traders, then the traders sell to Kumbasari Market. This type sells large and medium size fish commodities.
- 3. Type three, fish suppliers sell their commodities through TPI (Fish Auction Place) Pasar Gunung to traders, then the traders sell to supermarkets. This type sells commodities of large and medium size fish
- 4. type four, fish suppliers sell their commodities through TPI (Fish Auction Place) Gunung Agung Denpasar Market to collectors, then collectors sell to Kumbasari Market traders, Pasar Kumbasari traders sell to retail traders (Badung Market, Pasar Kreneng, Pasar Sanglah. This type sells commodities of medium and small size fish.
- 5. Type five, fish suppliers sell their commodities through TPI (Fish Auction Place) Pasar Agung Denpasar to collecting traders, then collectors sell to Pasar Kumbasari traders, traders Kumbasari Market sells to retailers (Badung Market, Kreneng Market, Sanglah Market), retailers sell to traditional village market traders around Denpasar City.



Figure 1. Types of fresh fish supply chain channels for urban consumers in Denpasar City

The process of flowing commodities from suppliers to urban fresh fish consumers in Denpasar need costs known as marketing costs. The longer the marketing channel the higher the price of communication at the end consumer. Business actors in type 1 marketing channels are collectors and collectors' wives as retailers. Generally this is to meet the needs of visitors who want to shop for fresh fish commodities. The volume of trade in this type is not very large, only around 50-90 kg in one day, but on holidays usually sales volume increases. Marketing margin on type 1 marketing channels is Rp.5,000 per kg for all types of fish.

In the type 2 marketing channel, the business actors involved are suppliers, collectors and traders of Kumbasari Market. Suppliers sell to collectors, and collectors sell to traders of Kumbasari markets that move by using pick-up vehicles. The types of fish sold are large and medium size fish and are of good quality so the price is high. The overall margin is Rp. 11,000 per kg, each Rp. 5,000 per kg for collectors and retailers Rp. 6,000 per kg. Type 3 marketing channels, including suppliers, collectors and collectors sell to supermarkets. The highest marketing margin is obtained by supermarkets, considering that supermarket consumers are in the upper middle class. The margin received by supermarket businesses ranges from Rp. 12,000 to Rp. 15,000 per kg.

The type 4 marketing channel is the most important channel for fresh fish trading business players in Denpasar City, which involves suppliers, collectors, Kumbasari Market traders, and retail traders. The types of fish sold in this marketing channel are those of medium and small size and of poor quality. The overall margin was not as high as around Rp 12,000 per kg and the sales volume was not high. While the type 5 marketing channel is a channel that markets fish with small sizes so that the selling price is low.

Measurement of performance using the AHP method shows that each indicator has different weights, namely reability (0.276), responsiveness (0.299), agility (0.238) and cost management (0.238). Weight of reliability determinant factors is perfect order fulfillment (0.40), product quality (0.38) and process quality (0.22). The weight of the responsiveness determinant factors is the order fulfillment time cycle (0.89) and product delay (0.11). The weight of agility determinant factors are upstream supply chain flexibility (0.34), upstream adaptation ability (0.43) and downstream adaptability (0.23). Determinants of cost management are production costs (0.53), distribution costs (0.30) and product costs sold (0.17). At present some business actors involved directly in the fresh fish supply chain system in the downstream get the smallest added value. This is because they have never made improvements to the process of handling and presenting products that guarantee the quality and safety of the products being marketed. This is in line with the research of Artaya et.all (2015) which states that the distribution of added value received by actors is very dependent on how much innovation is carried out by businesses to satisfy customer expectations.

CONCLUSION

Based on the results of the research and discussion it can be summarized as follows:

1. The most popular types of fresh sea fish consuming by urban households in

Denpasar are kurisi fish (*Nemipterus nematophorus Threadflin bream*) with a general size of 12-18 cm, small reef fish / jangki 16-25 cm in size, and mackerel (*Restrekkiger brachysoma*) with a general size of 15-20 cm.

- 2. There were no significant differences in the frequency of purchasing fresh fish in working women and not-working women. However, there are significant differences in the frequency of purchasing processed fish for working women and not-working women.
- 3. There are five kinds of fresh fish supply chain chanell for urban household consumers in Denpasar. Type 3 supply chain structure (market traders, consumer-retailers) show performance with the lowest average weight and get the smallest value-added distribution.
- 4. Business actors involved in the supply chain system have not been oriented towards increasing value added and customer satisfaction. The mechanism of coordination is traditional and partnerships are built based on transactional interests only.

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