

**PACKAGING AND PRODUCT QUALITY ISSUES  
IN ORGANIC RICE DISTRIBUTION IN INDONESIA**

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Recently, there is a growing number of organic products consumption in Indonesia. Organic products come in various types, ranging from agriculture products (such as rice, grains, oils, fruits and vegetables), food and drink (such as fresh organic meal served in restaurants, packaged organic snacks and fruit juices), cosmetics (organic shampoo and body soap, organic body butter, organic make up collections) and even fashions (organic clothes, organic fabrics). Organic rice is one of the most popular product produced by our local farmers and distributed widely in Indonesia and overseas. Our research was conducted to identify common problems faced by Indonesian organic rice farmers and marketers in satisfying their consumers' need. Study 1 was done by administering focus group discussions followed by organic rice farmers and organic rice consumers. From Study 1 we found several key important issues related to organic rice distribution, such as reason for organic rice purchase, expected quality standard from farmers' v.s. consumers' point of view, packaging design and methods, organic labeling and certification, distribution channel networks, and product characteristics' limitations (easy to damage for its chemical and pesticide free requirement). Study 2 was aimed to elaborate packaging and storage methods for optimal quality of organic rice in experimental design. This study revealed that best packaging and storage method will lengthen the storage time and keeping the rice in its best quality for end consumers (lack of damage). Through this research findings, we corroborate previous studies on consumers' perception of quality, specifically in the case of organic rice distribution in Indonesia. Our findings in the packaging and storage

experimentation also proven that vacuum packaging method is one of the best solutions to maintain the organic rice quality for longer time. The practical implications of this study is that our research results provide a better insight in organic rice consumers' demography and perception of quality matching their needs.

Keywords : organic rice, quality, packaging, distribution

## **Backgrounds**

Organic rice consumption has increased in significant number since the last decade in Indonesia. This product becomes more popular for its many advantages compared to conventional rice (non-organic rice). Organic rice produced from organic farming systems which its main objective to work in harmony with the nature to provide healthy food for all mankind (Isnaini, 2006). This system seeks to exclude or limit the possibility of negative effects caused by chemical and pesticide that are usually applied in conventional farming, which in the end could maintain the richness of soil in the ecosystem by not causing environmental pollution (Sutanto, 2002).

The idea of our research was originated from the community engagement activities organized by the Universitas Tarumanagara with organic farmer groups at Sukoharjo, Central Java, in the year 2014. At the event, we found that in distributing their organic rice, farmers face problems in dealing with the characteristics of organic rice which are easily damaged by bugs. How farmers cope with the risk of a decrease in the quality of organic rice during the distribution process became the main question of this research.

We explore our research by engaging both farmers and consumers of organic rice. There are two studies at this research. We began our research on Study 1 by recruiting farmers and consumers from Sukoharjo and Jakarta to join a focus group discussion with organic rice distribution and consumption in Indonesia as the discussion topic. From this discussions, we

gathered several lists consists of critical problems faced by organic farmers concerning on their organic rice distribution as well as important considerations made by consumers when deciding to purchase and consume organic rice.

At Study 2, we aimed to find effective storage method that will meet the need to keep the organic rice at their best quality during distribution process. During April – October 2016, we conduct laboratory experiment on 16 organic rice samples which came from 4 different organic rice farms in Indonesia. We proposed that organic rice with specific treatments before packed will have longer storage time compared to those without treatment. We believe that by implementing the storage method tested in our study, organic farmers can raise their profit since the rice distributed are always in good quality at longer time.

## **Literature Review**

### *Organic rice consumption in Indonesia*

According to Huzna Zahir from Yayasan Lembaga Konsumen Indonesia, organic product consumption in Indonesia has grown significantly, especially among middle up level consumers and those with high buying power ([www.organicindonesia.com](http://www.organicindonesia.com), 2015). The rise of organic rice market segment in Indonesia brings positive sign for organic farmers, where by the end of 2015 the demand for organic rice in Indonesia has reached 720 tons per year ([www.radarcirebon.com](http://www.radarcirebon.com), 2015). This increasing number of organic rice consumers is because people are becoming more concern about the benefit of consuming the rice. Organic rice is believed to be healthier than conventional rice for its chemical free treatment during plantation, harvesting treatment and delivery process to end consumer. Organic plantation systems express healthier, safer, higher nutrients and more diverse bioactive components and richer chemical ingredients needed by our body (Purnama, 2014).

More than 90% of rice consumption came from Asian country with Indonesia as the big three along with China and India (Mohanty, 2013). Consumers' buying behavior on organic food products (thus, including organic rice) are triggered by many factors such as healthy lifestyles and back to nature campaigns, environmental issues, better farming and crops' distribution systems, as well as more affordable price of organic products. Suharjo et al. (2013) found that most of the upper middle class people in their research are familiar with organic food products. Moreover, about 13% of their samples are regularly consuming organic food in the form of vegetables, fruits, and rice. As the main staple food in Indonesia and even Asia, rice has the second highest rank among organic food products consumed after organic vegetables (Purwasasmita & Sutaryat, 2014).

#### *Consumers' perception on organic rice quality*

Organic rice has obvious costs and benefits information for consumers. Consumers may perceived that organic rice has higher expenses compared to conventional rice. They have to spend more money when deciding to buy organic rice other than conventional rice. However, the promises that organic rice is healthier and free of chemical residues have made consumers more confident about their choice in buying and consuming this rice. Nowadays, consumers' interests in food products with organic labels are increased as well as their awareness to live healthier, safer, and more environmentally friendly (McCluskey & Loureiro, 2003).

Previous studies have shown that when buying organic rice, consumers has a number of considerations, including the quality of organic rice. Several important attributes considered as high quality signal of organic rice are price, nutrient content, and the presence of information on the packaging (Idaman, 2012; Idaman et. al 2014). Other important attributes also become consumer's considerations such as brand name, packaging design and size, and the prevalence of quality standardization labeling (Syahrir et al, 2015). Wells et al. (2007) also found that 73%

respondent of premium food product in England rely on packaging design as important factors when making a purchase decision.

### **Study 1**

The purpose of Study 1 was to investigate current problems in organic rice distribution from both sides, farmers and consumers. We ran focus group discussions in two separated groups consist of organic rice farmers and consumers on March 2016. There were 10 farmers from Sukoharjo and 15 consumers from Jakarta participating in the discussions. Participants from both groups were ranging from 22 to 63 years old. All of the farmers were male and married, while 10 of the consumers were female and 3 out of 15 consumers were unmarried.

The discussions were focused to listed important issues in organic rice distributions in Indonesia. Most farmers mentioned about the difficulties to sell their organic rice to end consumers. Only 2 farmers directly sold their rice to end consumers who are their relatives, close friends, and some regular buyer from their neighborhood. None of our samples have stable distribution channel and network. They sell their organic rice to any wholesaler in the market who would like to buy their crops when the harvest time is come. However, some of them are already try to keep a small amount of the rice to be sold directly to the end consumers.

All farmers agreed that to fulfill the high quality of organic rice, they should maintain organic farming systems. No chemicals or pesticides ingredients during planting, harvesting, and distributing organic rice are requirements that must be executed by all organic farmers without any excuses. Meanwhile, the guarantee of chemicals and pesticides free of the rice also brings major problem for the farmer, since the rice is easily damaged due to the fast growing of rice bugs when the rice is not consumed at immediate time after the harvesting time. To handle this problem, farmers used to store their organic rice in the form of unhulled rice. They will mill the grain once the rice is going to be sell to the market. Unfortunately, when the rice is not sold for a long time, rice bugs will appear and make damage to the rice. At this situation, farmers suffered

some losses due to the decreased quality of the rice. Farmers expected their rice always in good condition for longer time in the market, so that they will not suffered from loss.

Only 1 of our farmers has organic certification and put organic label on its product packaging. The rest of the farmers, either were not granted the certification or were not want to be certified. Most of them complained that the process of getting organic certification is very difficult and very expensive that they could not afford it. Consequently, they could not put organic certified label on their organic rice packaging. Most of them also choose to sell their rice without brand name which made the price lower than average selling price.

From the consumers' group, we concluded that the main reason of organic rice purchase is because of the healthy benefit earned from regularly consuming organic food. Consumers' who usually consume organic rice are also regularly consume organic vegetables and fruits at the same time. They perceived organic rice price is higher than conventional rice and they believe that this higher price is applied due to the quality of organic rice itself. Most of them always buy organic rice at supermarket but several consumers buy their rice from online seller. All of them were agreed that if they can buy organic rice from online seller at more affordable price, they will choose to buy at online market rather than at supermarket. They are aware of the easy to damage characteristic of organic rice, but still they want the rice to stay sturdy (not contaminated by rice bugs) for long time storage. They suggest average time of storage for organic rice is only one month after first purchased and opening the packaging. After one month, soon rice bugs usually appear and their population will grow fast once the rice not being consumed.

## **Study 2**

Study 2 is a continuing study from our earlier research in April-June 2016. At our preliminary research, the samples which came from 4 different organic farms were divided into 4 different conditions: as is, freezed, sundried, and open aired. Samples in the first three

conditions were then stored at the air tight glass box, while in the last condition was only store at the glass box without any lid. From the first 4 months period of the laboratory experiment, we found that only 1 out of 16 organic rice samples is contaminated by rice bugs. This finding gave a preliminary conclusion that the experiment went well as we expected, where samples with specific treatments before packed are proven to have less damage than those without treatments (Tunjungsari, 2016). Furthermore, we found that the right packing method and process can maintain the quality of organic rice in a fairly long period, which ultimately means extending the storage time of organic rice at distribution chain.

We then continue to store all of the samples for the same 4 months period until October 2016 to get more precise conclusions of the research. After the first 4 months observation, we put no further treatment other than keep storing the samples with the same conditions. By the end of October, we made final observation on our samples. Samples in freezed and open aired conditions are free from rice bugs. Samples in sundried conditions remains the same as the first 4 months (only 1 sample with rice bugs and the population of the bugs are not growing), meanwhile those in as is conditions have rice bugs in a huge number which have made damage to the rice (the color is darken and the grain is crushed).

Table 1. Samples Condition at Final Observation

Organic Rice Sample	As is			Open aired			<i>Freezed</i>			Sundried		
	Humidity	Temperature	Rice bugs appearance	Humidity	Temperature	Rice bugs appearance	Humidity	Temperature	Rice bugs appearance	Humidity	Temperature	Rice bugs appearance
Sawangan	9,5 %	25° C	X	11,5 %	25° C	X	11 %	25° C	X	7,5 %	29° C	X
Pandan Wangi	12 %	25° C	X	13,5 %	25° C	X	13,5 %	25° C	X	10,5 %	29° C	X
IPB 3S	11 %	25° C	X	9,5 %	25° C	X	9%	25° C	X	8%	29° C	X
PePe	8%	25° C	X	7%	25° C	X	8,5 %	25° C	X	7,5 %	29° C	O

From Study 2, we can conclude that within 8 months period, most of our samples do not contaminated with rice bugs and have their good quality kept in longer storage time (more than one month). Treatments that can be applied to the rice are freezed, open aired or sundried, but the most important of storage method is that we must store the rice in an air tight container to prevent the rice bugs growth. Once we let the rice in open aired container, the bugs will easily get oxygen from the air and will grow fast in the rice. This will make the rice damage and the rice become less marketable because poor quality.

### **General Discussions**

From Study 1 we found that both farmers and consumers stated that easy to damage from rice bugs' growth is the disadvantage of organic rice. Farmers could not sell the rice once the rice bugs appear because consumers would not buy organic rice with that condition. Our experiments in Study 2 suggests that to cope with the easy to damage characteristics of organic rice, farmers should apply specific treatments and packaging method that will keep the rice free of rice bugs at longer time. The right packaging method will perform some functions which also reflect the quality of organic rice itself. Some functions of packaging are to protect, store, and contain the product, as well as to communicate with customers (Kotler & Keller, 2012).

According to Wier and Andersen (2003), consumer purchase organic products for internal and external reasons. Internal reasons contain direct affect for themselves such as health benefit, good taste and fresh product. While external reasons mean the intent to contribute in external context, for example for environmental or animal welfare. Our study also found that consumers purchase organic rice to get healthy benefit from the rice. They also mentioned that buying and consuming organic rice are also a part of sustaining the environment since they believe that organic farming system is good for the soil and does not produce any pollution that may harm the environment.



Organic certification labeling is essential both for farmers and consumers. Even if farmers feel inconvenience with the high cost of obtaining the certificate, maintaining the quality of organic product by being certified is very crucial (Sriyanto, 2010). In this study, both farmers and consumers perceived that organic certification labelling is important and this certification represents good quality of organic rice. Therefore, putting organic certification label on the packaging might improve consumers' evaluation on product quality, which in the end will create greater intention to purchase the product.

### **Conclusions**

The main purpose of our studies were to find the best storage method to lengthen organic rice durability, especially along distribution chain at the market. Keeping organic rice in its good quality for longer time will make it possible to be distributed at a larger market and will raise farmer's profit since the rice can be stored in longer time without being damaged. In the pursue of providing good quality product to consumers, farmers must attempt to get organic certificate for their rice. Consumers purchase organic rice for healthy and environment preservation reasons. They also put higher value on organic rice with organic certificate label on the packaging.

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