

# ORGANIC BROWN RICE

THE INDUSTRIAL ANALYSIS REPORT

BY SEVENTH FLOOR



# ORGANIC BROWN RICE

SEVENTH FLOOR





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## ***ABOUT US***

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# INPUT

- Research paper (from on-line sources) about health benefits of organic products and brown rice
- Regulations about organic farming
- Health facts about people who consume brown rice regularly
- Journal, article and reports regarding the growth of organic products, rice, white rice and brown rice
- Health facts about people who consume brown rice regularly

# PROCESS

- Comparing data relevant to health benefits of organic products and brown rice
- Indicating benefit of organic farming to environment
- Indicating benefit of organic products to health of the consumers
- Analyzing the consumption and market of both organic products and brown rice.

**T**HIS RESEARCH will use the framework which put in the logic model. Logic model is useful in many ways, actually logic model is a systematic design not only for visualizing the understanding of the research, but also representing the relation between any resource that we can find. The usage of logic model is to describe the planning work until the results is achieved to all stakeholders. Hence, we can translating the logic model into the action, by looking from the input until the outcomes. This logic model will describe research over the time from planning through results with a road map of related events.

The stakeholder of this Industrial Analysis Report are students, lecturer, assistant teaching, classmates, farming practitioner, and everyone who has interesting in organic product. Whereas the input for this logic model are the data on the interested areas such as, the market trend of organic products and brown rice,

the yearly consumption of rice, etc.

After attaining the target data they will be compared and analyze. For example in the marketing section, data about the yearly consumption of rice, brown rice and organic products are compared in attempt to find the trend of the "organic brown rice". On the other side of the logic model, there lies the output. In this output section the data processed earlier are presented to the readers. For example, judging from the statistics that indicates the growth of rice, brown rice and organic products consumption, one could conclude that organic brown rice has a potential to grow.

And ultimately, the outcomes of this industrial analysis report (IAR) is to convince readers to turn their appetite toward organic brown rice, or at least organic products; and to convince potential investors to invest in this market.

# OUTPUT

- Consuming organic brown rice will reduce risks of health problem
- Organic farming improves environment
  - Improvement on fertility soil
  - reduces pollution released during the farming process
  - reduces chemical residual in the environment
- People who consume organic brown regularly are healthier than those who consume white rice
- The global consumption of brown rice is increasing resulting in a larger market size

# OUTCOME

- Convince readers to eat more organic product
- Increase the people's awareness about environment
- People has the longer life expectancy
- Improve the quality life by consuming better food
- Convincing potential investors to invest in organic brown rice

# LOGIC MODEL

This research will use the framework which put in the logic model. Logic model is useful in many ways, actually logic model is a systematic design not only for visualizing the understanding of the research, but also representing the relation between any resource that we can find. The usage of logic model is to describe the planning work until the results is achieved to all stakeholders. Hence, we can translating the logic model into the action, by looking from the input until the outcomes. This logic model will describe research over the time from planning through results with a road map of related events.

# 1 HISTORY AND DEVELOPMENT

This chapter will be focusing on the history and development of organic industry. Because in order to understand more on one topic we should look deeper in to its background.

**B**EFORE the new modern era, particularly in early 20th Century, majority the food which grown across the world was still organic. At that time it was just food, it had not been called as organic food. Nobody had thought to use the chemicals substance into the soil in order to enhance the growth from the corps.

With the emerging of the petrochemical industries in early 1900s, agricultural try to find the way to optimize their result by doing research and focus on the chemicals that are required by plant and animal growth. Apparently, those chemicals is coming from finite resources, most of them are by-products of oil refining. This action actually could trigger another problems, and usually ignored until the problems became big.



## FOUNDATION OF ORGANIC

American and British publications form the foundation of organics. Writers in the United States and Great Britain - Sir Albert Howard, Rudolf Steiner, Lady Eve Balfour and J.I. Rodale to name a few - publish influential works introducing the basic idea of organics. They posit that the health of plants, soil, livestock, and people are interrelated. They advocate for an approach to farming based on working with natural systems rather than trying to control them.



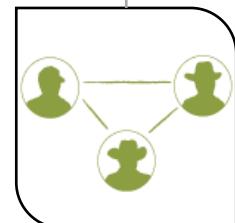
## FIRST USED OF DDT

**1939** - Paul Muller developed DDT, the first of a new class of insecticides - chlorinated hydrocarbons to counter the pest problems. Since then, a new way of farming emerged, where the use of chemicals was heavily promoted. This led to the outright dismissal of organic farming methods.



## CHEMICAL PESTICIDES AND HERBICIDES USED

Synthetic pesticides and herbicides are introduced to American agriculture as part of the Green Revolution.



## NATURAL FOOD ASSOCIATES (NFA)

Consumers gain increased access to organic food, with the forming of Natural Food Associates (NFA) in Atlanta, Texas, to help connect scattered organic growers with fledgling markets for organically grown foods.

1920s

1930s

1940s

## DEVELOP THE U.S. NATIONAL STANDARD

**1990** - Organic Foods Production Act (OFPA) developed a national standard for organic food and fiber production. OFPA mandated that USDA develop and write regulations to explain the law to producers, handlers and certifiers. OFPA also called for an advisory National Organic Standards Board to make recommendations regarding the substances that could be used in organic production and handling, and to help USDA write the regulations.



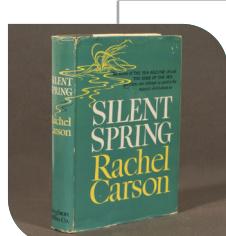
### GROWTH OF ORGANIC CROPLAND

**1998** - The USDA's Economic Research Service releases a major study on the status of organics in the United States showing that certified organic cropland more than doubled during the previous decade and that some organic livestock sectors - eggs and dairy - grew even faster.



## THE "BE NATURAL" APPROACH

**1980-1970** - The 'be natural' approach is growing as result of the growth of consumer interest in health and nutrition, the growth of the green movement, the focus on conservation and environmental issues stimulated the development of the organic market and encouraged farmers to adopt organic methods



## SILENT SPRING

**1962** - Rachel Carson's Silent Spring published. The book documents some of the negative consequences associated with chemical use in agriculture and gives rise to a new environmental consciousness and renewed focus on organic agriculture.



### OPPOSITION TO CHEMICAL PESTICIDES

**1973** - Consumer opposition to chemical pesticides grows. In United States started to bans the pesticide DDT, which some mark as the start of the modern environmental movement. The organics industry grows appreciably due to expanding consumer opposition to chemical pesticides coupled with a desire for food that is produced without harming the environment.



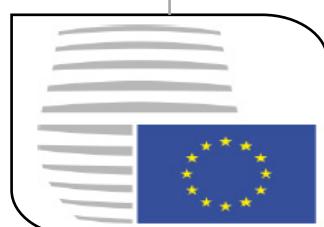
## IMPLEMENTATION OF U.S. STANDARD

**2002** - The Organic Standards arrive with the full implementation of the U.S. National Organic Standards takes place October 21st.



### MORE FUNDING ON ORGANIC RESEARCH

**2011** - US Government and non-government entities provide funding for research activities regarding to the sustainable agriculture including organic food and farming.



### REGULATIONS FOR RESIDUE LEVELS

**2015** - the European Union Council has decided about pesticide maximum residue levels and to oppose the adoption of a Commission regulation amending annexes II and III to regulation 396/20051 as regards maximum residue level for some chemical substances, such as Trichoderma polusporum, Trichoderma aperellum, etc.

1950s-1970s

1980s-1990s

2000s-2010s

# ORGANIC

**R**ECENTLY, people start to realize how health become more and more important. There is wise words says it better to prevent before something bad occurred. Many nations agreed to start with organic and creating the organic and healthier world. If organic food is able to change the people's habit, then a healthy life is no longer a dream to be reached.

In fact, according to National Organic Standards Board (NOSB) organic food is an ecological production management system that promotes and improve biodiversity, biological cycles and soil biological activity. It is based on minimal use of farm inputs and on management practices that restore, maintain ecological in harmony. This definition is similar with sustainable agriculture. Based on Lockeretz about organic farming and Drinkwater about cropping system, the characteristic of sustainable agriculture are reduce soil erosion, lower fossil fuel consumption, less leaching of nitrate, greater carbon sequestration and little or better no pesticide use.

Dr. Henry Chang, an international renowned organic researcher, said organic food means all farming products which free from chemical manure, pesticide and all other chemical substances since the beginning process of farming, it means all process should be conducted in natural way. The example for plowing soil using traditional way, using the natural manure or utilizing organism such as worm by inserting it into soil in order to increase soil fertility. This action will cause soil to be oxidized, therefore minimize land polluted, air, and water in area around farming. Even though chemical fertilizer will boost the growth, improve the productivity and give more harvest result, but actually it will only good in short time because not only the nutrient contain from food will be diminished, yet the soil fertility will decrease gradually.

The main characteristic of organic farming is using green manures such as animal dung and the plant's leaf. Organic farming also need the crop rotations to improve the fertility of the soil, enhance biological activity and maintain the long-term soil's health. However, organic farming also uses biological control, and crop rotations to



manage weeds, insects and crop diseases. the nutritional value and also taste which The main purpose of organic is try to lost in the process, enhancing the texture, reduce and eliminate the usage of synthetic extending its shelf life, preserving food pesticides and chemical fertilizers and from decaying, giving extra taste or other substance, such as antibiotics. Finally increasing appealing from the junk foods. organic is focus on renewable resources, The long term effect of the food additives water, soil conservation, and restore the are still questionable, particularly the ecological balance by management farming. combination of literally chemicals residual

Organic production is not simply found in the food. Many food have caused to avoid chemical inputs for the farming consumers into allergy, headaches, process, nor is it merely the substitution asthma, obesity, heart disease and the to natural inputs. Organic farmers applying worst case is cancer. How can we avoid methods used from thousands years ago, the harmful effects of food additives is such as crop rotations and the using of by educating ourselves and choose foods animal manures and green manure crops, to that give benefits for ours health. The gain the sustainability in nature. In organic usage of additives food is very restricted production, health is become the focus, and in organic food.

the management farming techniques is the primary concern. Organic producers are of organic product are biodiversity, implementing the strategies to develop and diversification and integration of maintain biological diversity and replenish enterprise, sustainability, natural plant soil fertility "Organic Agriculture Overview, nutrition, natural pest management. Finally USDA, Cooperative State Research, organic product should has the integrity Education, and Extension Service (CSREES), which refers to the systems in place 2007"

To summarize, the principal To summarize, the principal primary concern. Organic producers are of organic product are biodiversity, implementing the strategies to develop and diversification and integration of maintain biological diversity and replenish enterprise, sustainability, natural plant soil fertility "Organic Agriculture Overview, nutrition, natural pest management. Finally USDA, Cooperative State Research, organic product should has the integrity Education, and Extension Service (CSREES), which refers to the systems in place 2007"

Each countries has their own organic products get what they pay for. regulation about food additive, as example Consumers have a right to expect that the there are more than 300 substances in organic food they buy not only be raised Australia which are permitted to be used by organic methods but also be protected for food additives. Each of additive food is from the contamination from non-organic identified by its name and a number, and substances.

classified by the function it performs. The main purpose of food additives are replacing





**B**Y DEFINITION whole grain products are products that the whole kernels are intact, meaning that the three essential parts – namely the bran, endosperm, and the germs – are present. Else they would not be qualified as whole grain. A whole grain could be compared to eggs – the bran as the shell; endosperm as the egg white; and the germs as the yoke. Just like eggs' shell, bran protects the kernel from harm, be it by insects or environment. The germs are like yokes, they feed on the endosperms like how yokes feed on egg whites. However the difference between eggs and whole grains is that much of the essential vitamins of a whole grain lies in its bran, which is why it is so important that every part of a grain must be intact in order to be qualified as whole grain.

### Whole wheat Vs Whole grain

A lot of people tend to confuse whole wheat with whole grain. Explaining this in a simple way would be to compare cabbages to vegetables. If asked that way people could come up with an

answer right away that cabbages are vegetables but not all vegetables are cabbage. This is also true for whole wheat and whole grains. Whole wheat is a type of whole grain just like cabbages are a type of vegetable.

### Example of whole grains

- Amaranth
- Barley
- Buckwheat
- Corn, including whole cornmeal and popcorn
- Millet
- Oats, including oatmeal
- Quinoa
- Rice, both brown rice and colored rice
- Rye
- Sorghum (also called milo)
- Teff
- Triticale
- Wild rice
- Wheat, including varieties such as spelt, emmer, farro, einkorn, Kamut®, durum and forms such as bulgur, cracked wheat and wheatberries

# WHOLE GRAIN

There are a lot of confusion going on when it comes to "whole grain", so the below section will be obliged to explain the definition of whole grain. There will be examples and an explicit explanation on the most frequently asked question that some people do not know up till now: what is the difference between "whole wheat" and "Whole grain".

## Health benefits of whole grains

According to the [wholegraincouncil.org](http://wholegraincouncil.org), there are research yielding an interesting result that the consumption of whole grain products could alleviate chronic diseases. Even though the benefits can be seen more vividly in those who consume more than three servings daily, the study also shows that those who consume even a small amount of whole grain will also benefit from its nutrients.

The benefits of whole grains most documented by repeated studies include:

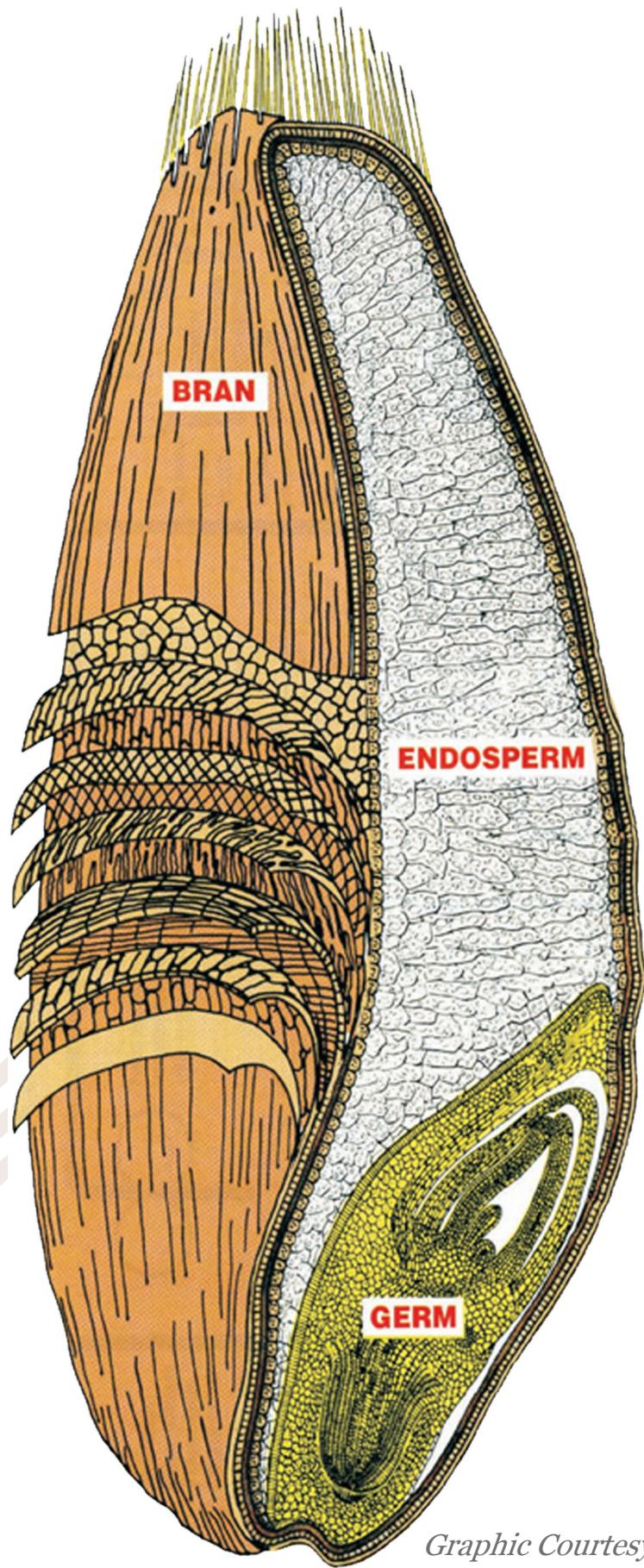
- *stroke risk reduced 30-36%*
- *type 2 diabetes risk reduced 21-30%*
- *heart disease risk reduced 25-28%*
- *better weight maintenance*

Other benefits indicated by recent studies include:

- *reduced risk of asthma*
- *healthier carotid arteries*
- *reduction of inflammatory disease risk*
- *lower risk of colorectal cancer*
- *healthier blood pressure levels*
- *less gum disease and tooth loss*



# GRAIN ANATOMY



*Graphic Courtesy of the Wheat Foods Council*



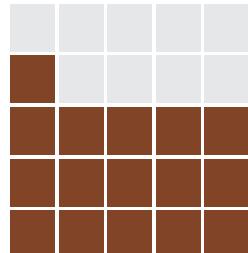
# INTRODUCTION TO BROWN RICE



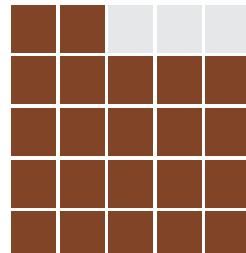


# 2 ORGANIC VS NONORGANIC

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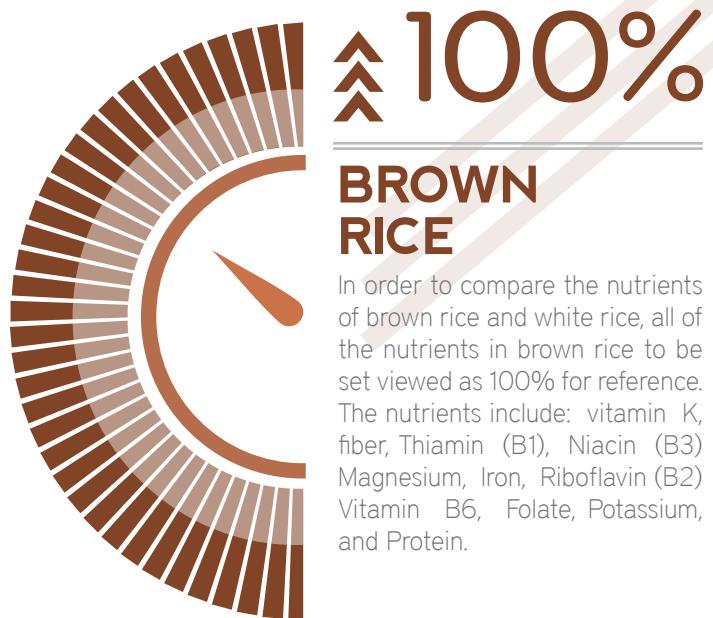


# BROWN RICE VS WHITE RICE

Most people have been eating white rice since they were young, and everyone knows that brown rice offers more health benefit. However only few have an idea regarding the magnitude of this difference. We will be comparing the difference in terms of nutrients between white and brown rice in this section.

**T**HE DIFFERENTS between white and brown rice lies in their aroma, taste and texture. While many claimed that brown rice smells different from the white rice they are used to they refuse to consume white rice, however the majority of people who have actually tried brown rice actually prefer its strangely appealing taste over white rice. Despite many reasons that turned people away from brown rice – be it the higher price or longer cooking time – brown rice holds many more essential nutrients to human body.

Brown rice contains 20 times more vitamin K than white rice, moreover white rice holds less than 55% of all nutrients present in brown rice except for protein content (compared to brown rice, white rice hold up to 90% protein present in brown rice). When comparing the two it should be obvious that brown rice is the better choice. There are even studies showing that the nutrients in brown rice can help in many chronic deceases.



## Good to know:

The reason that brown rice is more expensive is because in the brand, there contains some kind of oil along with the vitamins. That oil reduces the shelf-life of brown rice.

*2011 Oldways/The Whole Grains Council, All values from USDA Nutrient Database, SR 23*

**BROWN  
RICE**

In order to compare the nutrients of brown rice and white rice, all of the nutrients in brown rice to be set viewed as 100% for reference. The nutrients include: vitamin K, fiber, Thiamin (B1), Niacin (B3) Magnesium, Iron, Riboflavin (B2) Vitamin B6, Folate, Potassium, and Protein.

**WHITE RICE**

By combining all of the nutrients content in white rice and dived by the number of candidates, we can see that white rice contains only 39% of the nutrients that brown rice holds.



The support from government can be seen from the regulation. With support by awareness from the consumer about healthy life style, combine by the government regulation could make organic food developing into further level. Although the price is rather high than the conventional food, the national campaign for organic food also give significant effect to the development of organic food. The government also socializing eco farming to the farmer, ensuring and keeping the buying price for the farming product high.

**N**OWADAYS, the understanding of farming product is growth from knowledge increasing quantity production to fulfil the food needs into the increasing of quality and the safety of food itself. Quality that consist of taste, nutrient and vitamin contents. Food safety cover of the chemical residual contain in the food caused from the farming process, pesticide, herbicide which endanger human health.

Before starting business in organic product we need to pay more attention to the regulation that valid in the nation that we want to start business. We should concern about domestic

regulation, however as a developed country and reputed as modern agriculture industry, United States regulation usually seen as guideline by the other countries.

The United States organization who regulate the farming, particularly organic farming is known as United States Department of Agriculture (USDA). This organization recognize four categories of organic products, the first one is crops, means: food harvested from plant, livestock feed, fiber, or any used substances to add nutrients to the field. Second is livestock means food coming from animals or in the production of food. Third is processed products

# POLICIES AND REGULATIONS 3

which consist of all items that have been handled and packaged, processed, and packaged. The last is wild crops or plants from a growing site which not cultivated. For this regulation we are more focus on the crops regulation.

## Farming regulation

A description of the monitoring practices and procedures to be performed and maintained, including the frequency for what they will be performed. It also discussed how to implement cultivation practices which maintain the chemical, physical and biological condition of soil, and minimize soil erosion as well.

One important thing from farming regulation is about the crop rotation. The practice of alternating the annual crops grown on a specific field in a planned pattern or sequence in successive crop years so that crops of the same species or family are not grown repeatedly without interruption on the same field.

The producer must implement a crop rotation, green manure, improve soil organic matter content, then providing pest management in crops, finally managing the deficient or excess plant nutrients and provide erosion control. This regulation hope that having well defined boundaries to prevent the unintended application of a prohibited substance to the crop or contact with a prohibited substance that is not under organic management.

## Substance

The criteria in the evaluation of substances or ingredients for the organic production: Synthetic and non-synthetic substances considered for inclusion from the National List of allowed and prohibited substances.

The usage of synthetic substance used as a processing aid will consider these criteria: first is that this substance cannot be produced from a natural source and there are no organic substitutes. Then substance which is allowed if it don't have adverse effects on the environment and has compatible with organic handling, and also the nutritional quality of the food is still

maintained when the substance is used, and the substance itself doesn't have an adverse effect on human health as defined by applicable Federal regulations. The other condition that synthetic substance allowed is the primary use is not as preservative. Moreover the substance is listed as generally recognized as safe (GRAS) by Food and Drug Administration (FDA). Another requisite is the substance that essential for the handling of organically produced agricultural products. While Non-synthetics used in organic processing will be evaluated.

## Certification and labelling Process

### Cost for certification

The certification costs is depending on the certifying agent and the size, type and complexity from the farming operation. According to USDA website, the costs has range from few hundred to thousand dollars. Before applying they suggested to understand the fee structure and billing cycle. Generally, the fee is an application fee, annual renewal fee, assessment on annual production or sales, and inspection fees. The benefit of certification is after you are certified, the USDA Organic Certification gives Cost-Share Programs which farmer can reimburse operations up to 75 percent of their certification costs.

### Labelling

In United Stated if we want to seek for organic products in the marketplace, consumers should find for the USDA Organic Seal or a certifier name on the label. The U.S. Department of Agriculture categorized four kind of organic labels. This labelling based on the percentage of organic content in that product. This means that not only the organic ingredients in processed products certified, but also the facilities that handle and process the products are inspected and certified as well.





# 4 PROCESS AND TECHNOLOGY

There are different steps in rice processing. In This section we will be talking how brown rice, white rice and enriched rice are made. However enriched rice may not sound familiar to a lot of people, so please refer to “Good to know: Enriched rice” section on this page.



## Good to know:

Along with the bran, the milling process removes over half of the essential vitamins from rice. And enriched rice are rice that have been processed in order to put the back the loss vitamin in to white rice, however they are still worse comparing to the original brown rice

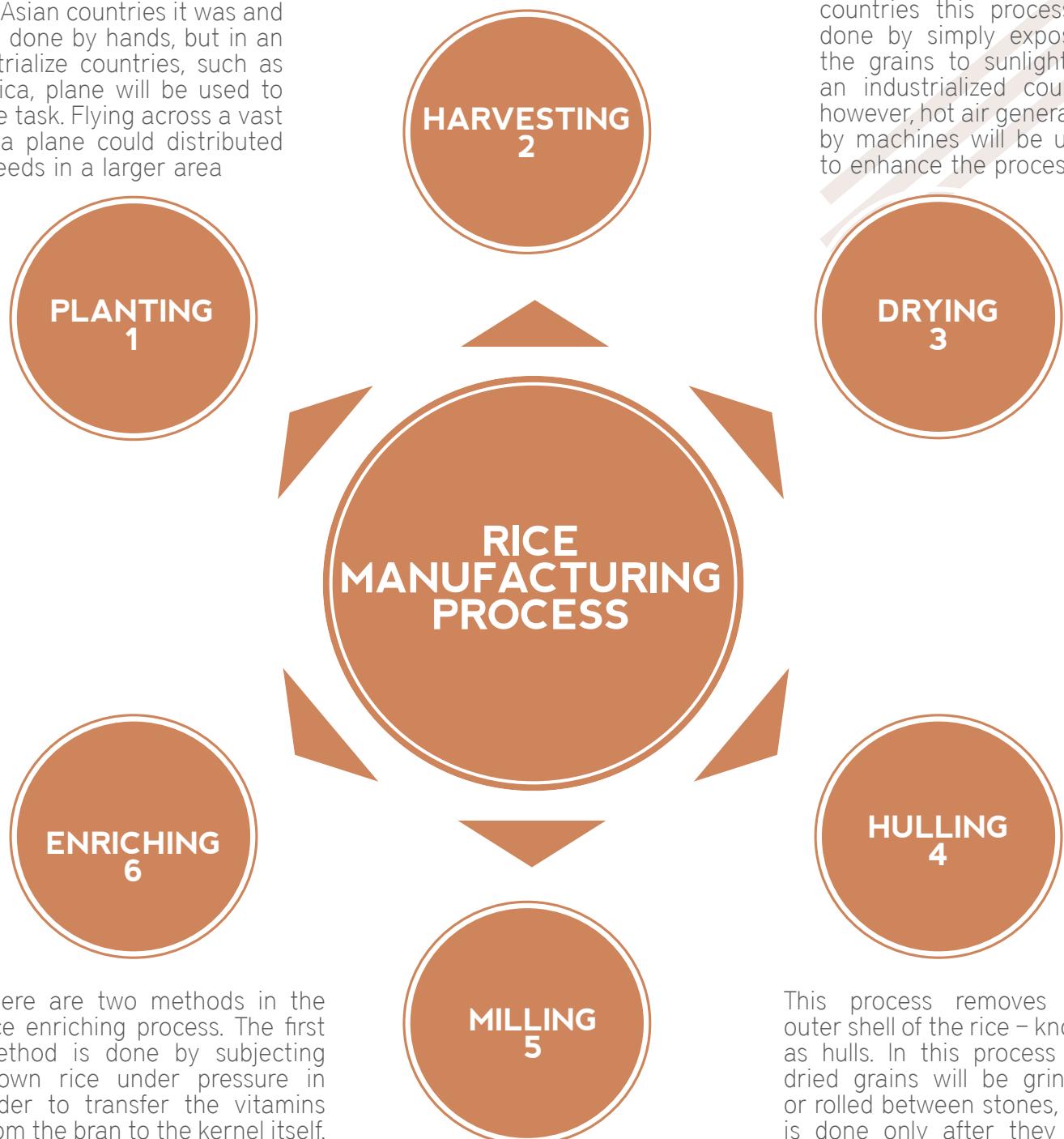


**BRIEF,** information prior the planting is that the land needs to be prepared before the seeding takes place. This is either done by machine or manually. In the early stage of rice cultivation, the land will be shaped into paddies. And the field will be flooded with water (around 20 Cm). The seeds will be soaked before planted in to the prepared bed. When it's time that the rice are ripe enough, the harvesting will commence. After being dried the rice will be hulled producing brown rice. And if either white or enriched rice are desired they will run the rough rice through 2 hullers.

After the fields are prepared, the soaked seeds will be deployed separately throughout the fields. This can be done by either hands or machines. In most Asian countries it was and still is done by hands, but in an industrialized countries, such as America, planes will be used to do the task. Flying across a vast field, a plane could distribute the seeds in a larger area.

After 12 to 13 months the ripe rice grains will be ready for harvesting. This again can be done by both manually and machines. By hand the stalks will be cut using sharp blades. This classical conduct still take place in most countries in Asia. In an industrialized country, automated mechanical harvesting machines will be used. By going through the machine the rice stalks will be harvested and staked in place before separating the grains from the stalks.

Before proceeding the rice grains need to be dried. In most developing countries this process is done by simply exposing the grains to sunlight. In an industrialized country however, hot air generated by machines will be used to enhance the process.



There are two methods in the rice enriching process. The first method is done by subjecting brown rice under pressure in order to transfer the vitamins from the bran to the kernel itself. The other way was to submerge the milled rice (white rice) in to vitamin bath.

By running the brown rice in to another huller their brans will be removed resulting in white rice.

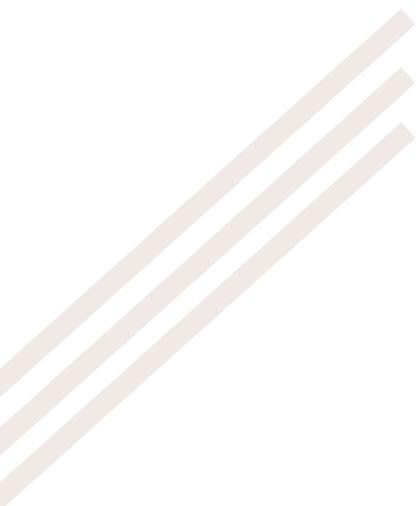
This process removes the outer shell of the rice – known as hulls. In this process the dried grains will be grinded or rolled between stones, this is done only after they are cleaned. Often this process is done by machines. The hulled rice are called brown rice.



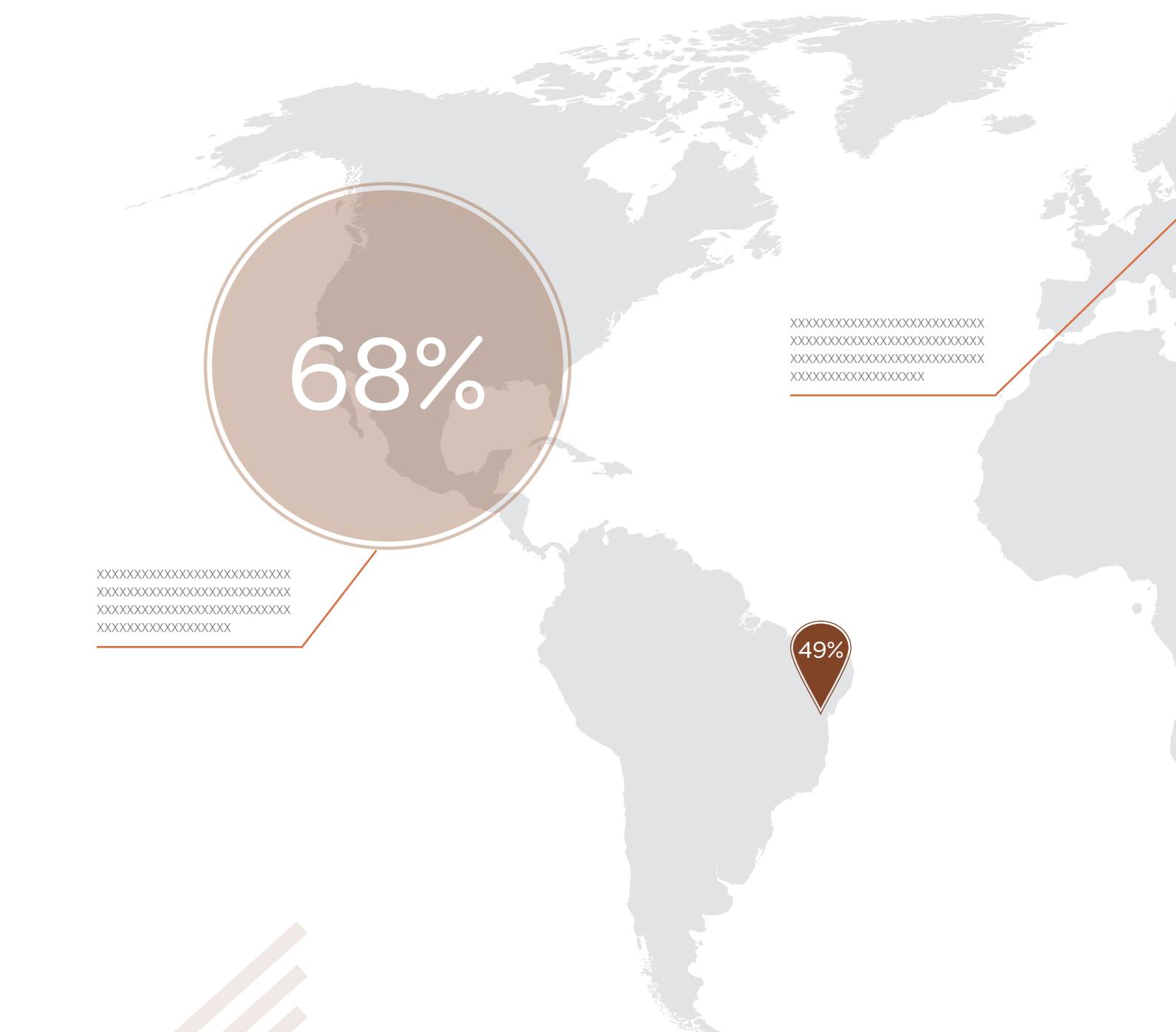
# 5 MARKET ANALYSIS

This market analysis section will be focusing on the food market, with the aim to identify trend of organic brown rice products from the available data.



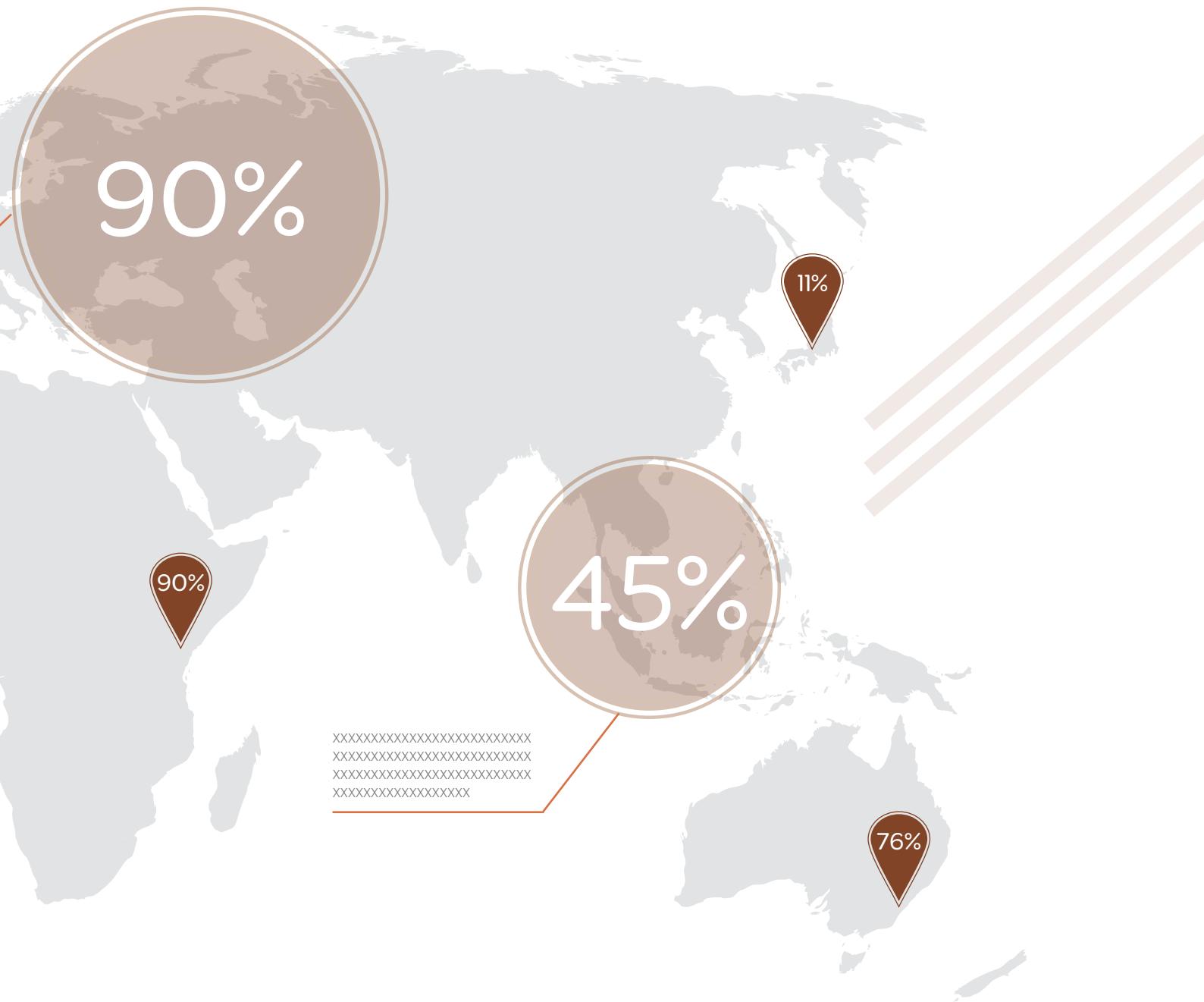






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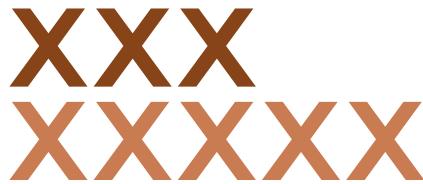




# INTERNATIONAL TRADING

## NOTE

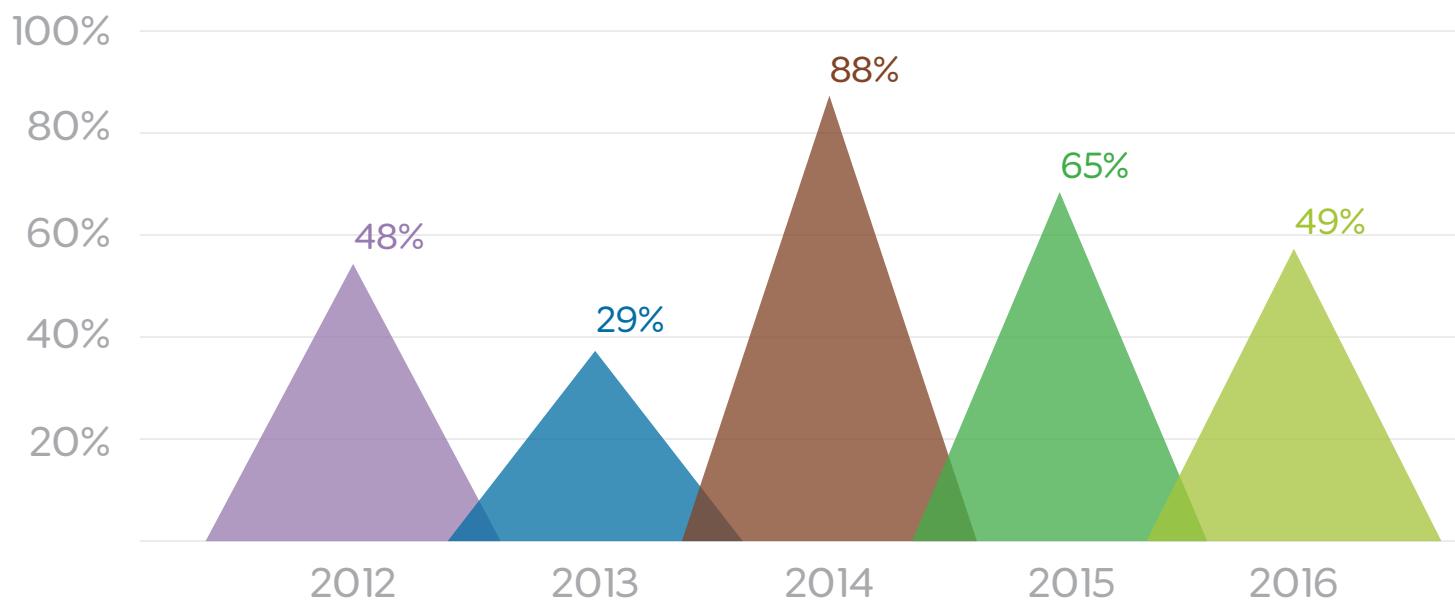
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## NOTE



# 6 DISCUSSION AND CONCLUSION

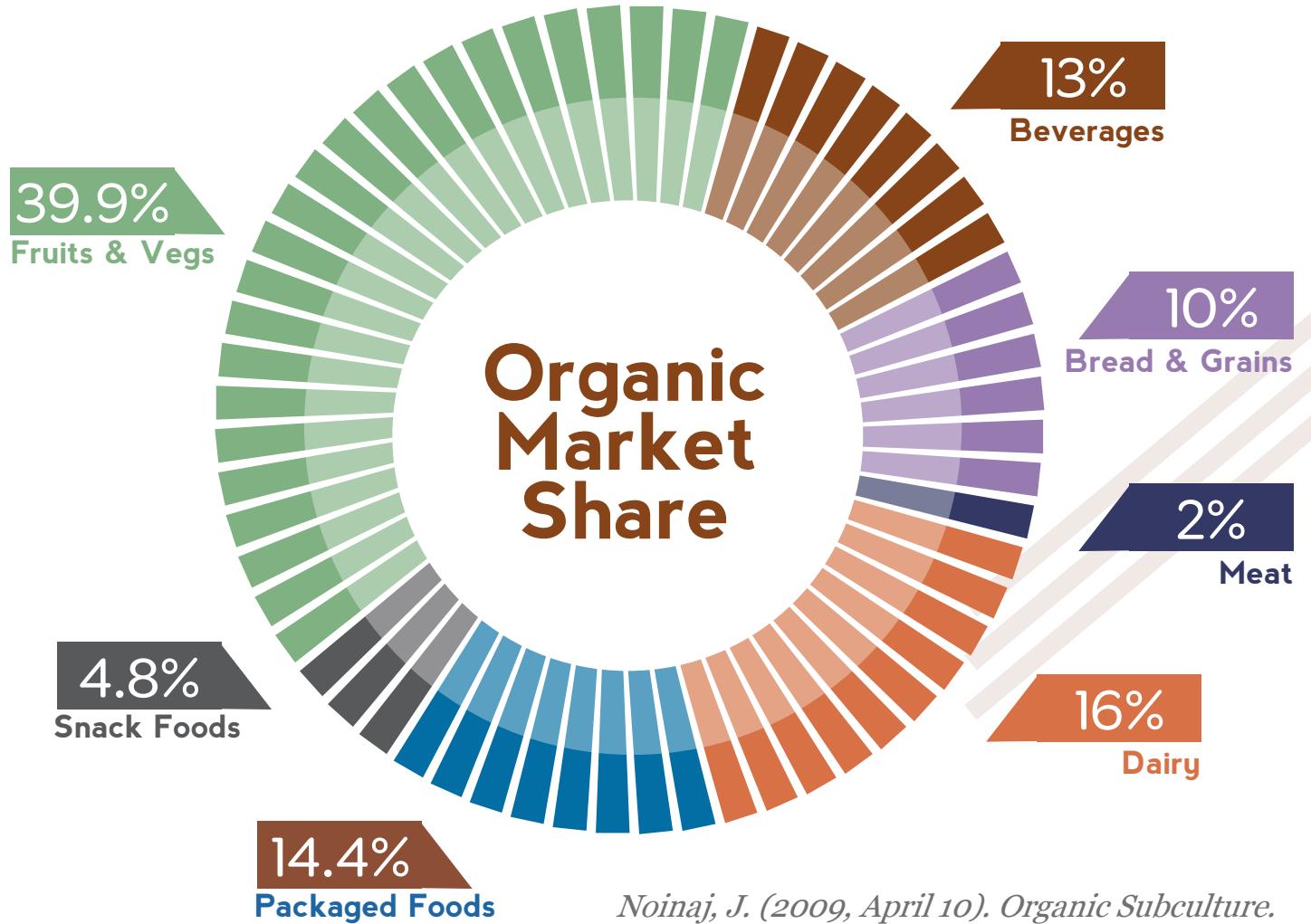
The section below will be given to conclusion and discussion. Most of the content in here will be from the authors' opinion regarding the organic brown rice market - based on the data found from online sources.

**T**HE AIM of this industrial analysis report is to see the market trend for organic brown rice, as well as to describe the benefits of brown rice over white rice, and to convince the reader that there are still clear and far future for this product. However with no specific data regarding this topic, other sets of relevant data are used for analysis. ALL OF THE DATA/STATISTICS DISPLAYED IN THIS REPORT ARE TAKEN FROM OTHER SOURCES LISTED IN THE REFERENCE SECTION.

As far as statistic shows, the consumption of rice has been gradually climbing. Throughout the years its pace may be hindered by the economic crisis, but the fact remains that it is making its way up in the food industry. Seeing how much rice is consumed comparing to the increased in the treading value of brown rice in addition to the decrease in white rice (please refer to Consumption trend on Pg.27-28), one could say that the future of brown rice in the market is still bright. For the organic market, there are also data indicating the growth in this field, be it the growth in investment or land used for organic farming. As mentioned in

the Variables section (on Pg.25-26), there are many factors in play when it comes to marketing. So even if there are no data specifically gathered for "organic brown rice" it is possible to see the trend of this market.

As one country develops further its concern for health increased proportionally. This can be proven by the increasing sells on organic foods. Price may be the only factor hindering the growth of organic product. But this hindrance could be overcame by the economy of scale, if more people choose to consume organic product, the price will surely be reduced. However every factors are related to each other. For example if the consumption rate of the customers increase the price will increase. Then seeing that there are more consumers the manufacturers will likely to invest more to produce more; this will cause the price to drop due to more competitors and lower cost. The improvement in technology will also the manufacturers to produce rice at a quicker pace, and sometimes lower cost. Moreover the regulations regarding the manufacturing procedures of the product itself may influence the cost, which will consequently effect the vending price.



Noinaj, J. (2009, April 10). *Organic Subculture*.

The pie chart above expresses the different types of organic food in the organic market in percentage. While organic fruits and vegetables seem to dominate the market with over 39% of the organic product, bread and grains made up to only 10%. Knowing that the volume of rice consumption is increasing, and the organic market is growing in parallel to it, is a signal that was hinting the direction of this market. However this data is a snap shot of the organic market in 2007, so the value may be different now.

It is difficult to distinguish organic food with conventional food especially when consumer want to purchase it from the shop or grocery. Although a lot of study about organic food state that consuming organic food will give a better nutrient content, less heavy metal residual, and certainly a better taste than conventional food, the only way to differentiate it is by looking for the labels which gave by the organic authorized assessor. Therefore, organizations who gives the labels should be able to gain trust from consumers. In the era of technology information, we think the use of block chain technology will give a lot of benefits. The principal of openness and transparency from block chain will attract public, so they can personally check the certification process. This will highly boost the consumer's trustworthiness. In addition the utilizing of information technology, such as "layar" application can facilitate consumers to verify the organic logo that given by authorized organization.

**CHAPTER 1**

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**CHAPTER 2**

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**CHAPTER 3**

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**CHAPTER 4**

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# BIBLIOGRAPHY

CHAPTER 5

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## CHAPTER 6

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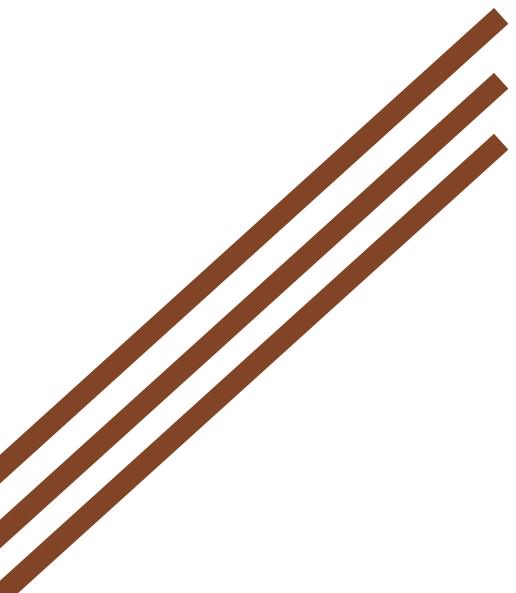
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