Understanding of Five Grains for YANG: a way to straighten Asians' dietary structure

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Abstract
According to the general opinion, grains should occupy the largest amount of human food each day, but this grain-based eating habit does not allow human life to be extended. Grains are high in carbohydrates and five commonly recognized plant hormones, namely auxin, gibberellin, cytokinin, abscisic acid, and ethylene. Through in-depth analysis of ancient books, it was found that five grains for support: support is a restriction, and it means the essence, which means that grains should be eaten less, and it is the essence of the least daily intake. To correctly understand the Chinese dietary concept of "five grains for support" is the basis for improving Asian dietary health and promoting Asian human health.

Keywords: Grains, Hormones, Carbohydrates, Eating habits

Introduction
The World Health Organization (WHO) recommends diversifying the dietary structure. WHO advocates a dietary structure that is composed mainly of vegetables and meats, accompanied by fresh fruits and a small amount of grain. Asian people, who account the 60% for the global population, still have a big gap between their consuetudinary dietary structure and this scientific dietary structure. Asian countries adopt an almost all diet mainly based on grain, some vegetables and only a small amount of meat. Investigating the reason, a misunderstanding of traditional culture “five grains for YANG (五谷为养)” may be the cause of the problem. Usually, these peoples think the main food is characterized by the largest quantity. The national dietary guidelines of China, Japan and Korea define grain as the most amount of food compared to vegetables, fruits and meats. Because of the traditional understanding is so rigid, it is difficult for them to accept the modern scientific dietary structure. Here we think it is necessary to clearly interpret the true meaning of the traditional classic theory of “five grains for YANG”. Then the recognition and acceptance of the modern diet structure may be adopted in the traditional Chinese cultural circle in Asia.

The concept of “five grains for YANG”
The five grains for YANG is described first in the ancient Chinese medical classic “Huang Di Nei Jing”. This proverb is described as “... eat grains for YANG (五谷为养), eat fruits for assist (五果为助), eat meats for benefit (五畜为益), and eat vegetables for nutritional supplement (五菜为充)...”. Here "YANG" is written in the earliest Chinese oracle bone inscriptions (Figure 1). It means to shepherd the sheep with a stick or whip. The graph shows a meaning of domesticating, controlling, and restricting animals as food. The best way to explain this "YANG" is to look at the root of Chinese traditional culture, Book of Changes. In this classic book, "YANG" is described as an image of hexagrams, Yi Gua. Shown as (Figure 2), the image looks like an open mouth. It describes that Yi Gua means that a man should use cautious words and restrain his diet. So, it symbolizes a meaning of not only self-support but also self-regulation and self-limitation. When considering nutrition, the character YANG (养) here means restraining rather than supplementing. When people think that main food is the largest amount to be eaten, the bias is revealed. Combined with today's scientific evidence, 'five grains for YANG' in the diet means that different types of grain are the most important food to support people's nutrition, but not the most amount a person should eat. People should control the total amount of grain, whatever kind, since five means many kinds. So, the word YANG means a restraint in intaking the essence of nutrient rather than an unlimited amount.

After a correct interpretation of nutrition, it is found that grain should be the least amount of intake by the human body among all kinds of foods.

Figure 1 Oracle bone inscriptions of YANG

Figure 2 Hexagrams of Yi Gua

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**Classic description of the harms of excessive grain**

In the theory of traditional Chinese medicine (TCM), it is not recommended to consume too much grain. Excessive intake of staple foods can cause some diseases. Then symptoms are expressed, such as acid reflux, bloating, abdominal pain, nausea, inability to eat and bad breath. It is said that the grains are stagnant in the digestive system, so it results in diarrhea, malaria, and other symptoms. Modern studies have shown that excessive intake of grain may lead to the accumulation of harmful hormones or toxins. The nausea and vomiting may be related to the deposition of plant hormones in the human body. Plant hormones have a similar molecular structure to human estrogen, and can combine with estrogen receptor alpha (ERα) and estrogen receptor beta (ERβ) to produce similar effects to estrogen, such as estradiol that can be absorbed through the digestive tract. Excessive intake of grain causes bloating or constipation because plant seeds contain ethylene. Carbohydrates have the highest respiratory quotient. When the proportion of carbohydrate intake in total energy is greater than or equal to 60%, the prevalence of hypertension increases significantly. Higher carbohydrate intake is associated with an increased risk of different cancers. Higher carbohydrates cause the body to be in a state of hyperglycemia, followed by relative hyperinsulinemia. It results in high levels of insulin that competitively reduce levels of Insulin-like growth factor (IGF)-1binding protein, and correspondingly IGF-1 activation. It promotes cell mitosis through the IGF-1 pathway and affects the occurrence and development of tumors.

**Essential and restrained grain**

TCM found that a small number of edible grains is important to the release of certain therapeutical substances. It can provide certain anti-aging subtle substances. In Han Dynasty, there was the so-called "thick porridge" that was respectfully presented to the elder. Also, some porridges are used for medicine in an antiviral treatment by increasing the insulin or other hormones. The Huang Di Nei Jing records "... How and why are five grains used to make porridge, decoction, unfiltered wine or clear wine? ... using it as a prevention for diseases..." As an ancient indoctrination, different elaborating extractions of grain can be used to treat infectious or infective diseases.

**Conclusion**

A correct understanding of five grains for YANG is important to Asians to accept a healthy dietary structure recommended by WHO.

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**Competing interests**
The authors declare no conflicts of interest.

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**Authors Contribution**

Jingchao Ma: conception, drafting, data acquisition and analysis of the work; Caijie Zhang: critical review of the work for important content; Wensi Zhao: approval of the final version of the paper; Ye Zhao: responsibility for the integrity, accuracy, and scientific validity of the work, as well as funding support.

**Abbreviations**


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