Paper ID	044
Author(s)	Kazuya Akimitsu
Title	Environmental Background of New Sugars: History and Potential of Rare Sugars

Abstract

Rare sugars are defined as "monosaccharides and their derivatives that present in small quantities in nature. There are only seven monosaccharides that exist in large quantities in nature, including D-glucose, D-fructose, and D-galactose and others. On the other hand, rare sugars exist in small amounts in nature, but there are many types, including 6-, 5-, and 4-carbon monosaccharides and sugar alcohols, totaling about 50 types. Most of rare sugars are produced biologically using enzymes or microorganisms, and monosaccharides, which are abundant in nature, are often used as raw materials. Because rare sugars are carbohydrates and strongly associated with sweetness, there is a strong impression that their use is generally limited to the food field. However, the applications of rare sugars are broader than expected, and methods to utilize rare sugars in various industrial fields have begun to be developed, including food, health-related, medical, anti-aging, and agricultural fields, etc. We will introduce the history of rare sugar research at Kagawa University, which is capable of producing all rare sugars, and the possibilities of using rare sugars in a wide range of fields that are being developed at this university. We believe that rare sugars will become a new resource in the sugar industry by combining the results of basic research with the development of their applications.

Keywords	rare sugar, D-allulose, application, production

Paper ID	067
Author(s)	Osamu Nakamura
Title	Miso soup with mochi and Natto Mochi --Traditional Japanese New Year's foods from the perspective of sweetness--

Abstract

The Keihoku area, located in the north of Kyoto, is in a mountainous region. There in the old days, barley and wheat did not grow well in winter, while soybeans grew very well in summer. At that time those soybeans cultivated in ridges between rice fields were not required to pay tribute to the ruler. Soybeans are rich in nutrients, but are too solid to eat and contain toxic ingredients. Through the process of making miso (fermented soybean paste) and natto (fermented soybean) from soybeans, people could make soybeans softer and detoxify them. To make miso they needed salt and malted rice, which were expensive, but to make natto they simply used rice straw.

Natto was most likely invented in Keihoku in the fifteenth century. This may be the reason why many people in Keihoku still have mochi (Japanese rice cake) with natto on the first three days of the new year. Here we may wonder why people in the other neighboring regions have miso soup with mochi on the new year days. One reason would be that it was rather difficult to make natto in other regions because it was warmer there in winter. Another reason may be the sweetness of miso, particularly of white miso, was quite attractive to people at the time when sugar was very expensive.

Keywords	miso, natto, Keihoku, soybeans, sweet

Paper ID	225
Author(s)	Josef Grulich

Title	From honey to sugar cube. Production and use of sweeteners in Bohemia and Moravia during the 18th-19th centuries

Abstract

So what did the inhabitants of Bohemia (Central Europe) sweeten with before the mass spread of refined sugar? The first item on the list is clearly honey, which - together with boiled fruit - was the most widely used sweetener in Europe.

It was not until the 19th century, which we now consider to be the golden age of the sugar industry, that a dramatic change took place. The whole industry began to flourish not only because of technical improvements in the sugar production process, but mainly because sugar beet was bred to grow to a much larger size and have a higher proportion of sugar content than its older varieties.

The invention of cube sugar was very important. Until the mid-19th century, sugar was distributed mainly in the form of sugar homols. Jakub Kryštof Rad, director of the refinery in the Moravian town of Dačice, is considered to be the inventor of cube sugar. He patented cube sugar in 1849. The first cubes were shaped like a cube with edges of 1.2 cm and 1.5 cm. A sugar cube usually weighs 3 to 6 g (typically 5 g). The colour can vary, but the most common colour is white, which is due to the use of refined sugar without added colouring agents.

Keywords	Land, Humans, Food, Sweeteners, Sugar, Cube sugar, Central Europe, Bohemia, 18th-19th centuries

Paper ID	226
Author(s)	Xueqin Mei
Title	Eating and Drinking Well -- A Study on the Environmental History of Diabetes Diet Therapy

Abstract

The so-called Diet Therapy, in short, is the practice of alleviating physical lesions through diet to avoid the aggravation of physical damage, which involves what to eat, how to eat, how was the food to eat, and so on. Paying attention to these issues are also essential conditions for developing a healthy lifestyle, including a healthy diet, which is particularly important in the fight against non-communicable chronic diseases. Diabetes, as a non-infectious chronic disease, is generally recognized as the result of internal and external factors. As far as external causes are concerned, poor lifestyle based on unreasonable eating habits is the main cause of diabetes. Long-term research in the international medical community has confirmed that a healthy diet or a reasonable diet has obvious efficacy in diabetes prevention and control, so relevant medical experts have particularly emphasized the significance of diet therapy for diabetes prevention and control.

As far as diabetes diet therapy is concerned, lots of people have made many discoveries in the way of diet in history, and thus accumulated a whole body of knowledge, including xylitol substitution for sugar, the concept of glycemic index, the consideration of food exchange, the implementation of the Rural Asian diet (RAD) plan, and so on. Fundamentally, the knowledge of diabetic diet therapy involves the cognition and practice of human being himself and his relationship with the natural elements of plants and animals, and can therefore be studied in the context of environmental history. This article focuses on the topic of diabetes diet, and intends to discuss the following questions from the perspective of environmental history: 1) How did the relevant measures appear in diabetes diet? 2) How have these measures deepened the understanding of human himself and of his inner nature or human nature? 3) How do they advance the discussion of the relationship between human and external nature? Based on the discussion of these issues, the paper further summarizes the multiple significance of the environmental history research of diabetes diet therapy.

Keywords	Disasters, Foods, Plants, Microorganism, Humans