

# Seitan and Gluten in Soba Noodles



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## Abstract

Gliadin (from gluten) extracts an immune response from the body. Gliadin looks like transglutaminase, an enzyme that is rather plentiful in the thyroid. The body's antibodies attack both the gliadin and transglutaminase. The thyroid gland is under assault whenever gliadin is in the blood stream. Popular noodles made from wheat e.g. ramen noodles, Okinawa soba noodles should be sidestepped to avoid consuming gluten. Another popular food item that should be avoided by vegetarians who are sensitive to gluten, are the traditional meat-like substitutes, which are made of gluten, called 'seitan'.

**Keywords:** Wheat; Barley; Rye; Gliadin; Transglutaminase; Soba noodles

**Abbreviations:** T2DM: Type 2 Diabetes Mellitus; CD: Celiac Disease; AD: Anno Domini

## Background

Consumption of wheat (gluten) has been linked to the development of Type 2 Diabetes Mellitus (T2DM) [1-4]. Hence, wheat has already been shown to be not such a good food, though rather easily available. Wheat is generally used for bread and baked goods, cereals, and pasta of all forms. A group of Japanese pastas that does not fall under these groups of foods with gluten is Japanese soba noodles. These groups of pastas are made of buckwheat, which naturally does not contain any gluten. One allowance of the Japanese soba noodles which is made of ordinary wheat is the Okinawa soba noodle. This being the exception and because of the close connection between Okinawa's history and culture with American history and culture, begs 'Okinawa soba noodles' to be mentioned in this paper. The objective is to remove any misconceptions about the makeup of this rather popular form of Japanese soba noodles, the Okinawa soba noodles.

Gluten is a protein in wheat (as well as barley and rye) and the associated grain products, and a majority of people are sensitive to its effects, while a minority is susceptible to gluten, making them to fall ill from Celiac disease. Celiac Disease (CD) had been identified by the great Greek doctor, Aretaeus the Cappadocian, in the first century Anno Domini (AD). In the digestion of gluten in the human body, gliadin is formed. In the body, gliadin is a molecular mimicry of transglutaminase, an enzyme essential for the forming of chemical bonds within the human body [5,6]. Even though present in many organs, the thyroid has a higher

concentration of transglutaminase. When gliadin (from the digestion of gluten) near the walls of the gut, the gut becomes more permeable and allows the large molecules of gliadin to enter. The human body instantly goes into processing an immune response. When the body's immune system attacks gliadin, the antibodies also attack the thyroid [7] because gliadin looks like transglutaminase. Because of the immune system's reactions, the thyroid is under attack/damage for up to half a year after gluten consumption [5].

## Seitan is Meat Substitute

This and the following two paragraphs about seitan is from reference [8], which provides a good information about its significance in Asian food culture: "Wheat gluten, popularly called seitan, wheat meat, gluten meat, or simply gluten, is a food made from gluten, the principal protein of wheat. It is manufactured by washing wheat flour dough with water until all the starch granules have been eliminated, leaving the tacky insoluble gluten as a flexible mass which can then be cooked before being eaten. Wheat gluten is a substitute to soybean-based foods such as tofu, which are sometimes used as meat substitutes. Some types of wheat gluten have a chewy or sinewy texture that is more similar to meat than other alternatives. For a presence of meat proffered (viewed as a sign of good hospitality, prosperity and good times) wheat gluten is often used in vegetarian, Buddhist, Asian and macrobiotic cuisines. Mock duck is a common use for wheat gluten. Wheat gluten proteins have low quality because they are deficient in lysine, which is an essential amino acid [9,10].

Wheat gluten first appeared during the 6th century as an ingredient for Chinese noodles [4]. It has historically been popular in the cuisines of China, Japan and other East and Southeast Asian nations." In Asia, it is often on the menus of restaurants cooking mainly for Buddhist, Hindu and other customers who abstain from meat. Since seitan seems to have so much history and tradition in Asian cultures, it is the focus of the current paper. Change is difficult anytime and anywhere. There is no clear substitute for seitan at the current time, but the truth has to be told since many persons who react negatively to gluten may be helped by the current paper.

### Promotion of Seitan

Seitan has been promoted as a meat substitute [11,12], especially to people who do not eat meat or fish. Among its benefits are availability, low cost, and its adaptability to different tastes. That seitan has been canned and exported to the Americas (from Asia), Europe and all over the world, bears taking note. With the increasing pace of life in the World's cities, working parents may be turning to this affordable 'natural' protein source as a daily diet item. Time may be of the essence if one considers the misinformation (which could take years to undo) that is carried around the world regarding the benefits of seitan. The health benefits of a vegetarian diet have [13-17] also been widely studied and promoted. That it is mostly coming from the vitamins and phytonutrients in the plant foods should be emphasized. The presence of gluten (from 3 popular grains) in many food products should not be overlooked, however. The increase of seitan's popularity via trade, etc. may be unfortunate since its health implications to the majority population of humans have not been fully determined.

### Discussion and Conclusion

Wheat has been implicated in T2DM, obesity and other diseases. This work mentions the publications which concluded that the gliadin (from gluten) activates the body's immune system in a negative way. In this work, it is pointed out that the popular meat substitute, seitan, is something to be watched. It is pure wheat gluten, and its effects, if consumed regularly, may be quite negative. Since seitan's popularity is more in Asia (and growing in Australia and Germany), its effects as a regular diet item should be further investigated with respect to those populations who would be affected most. It is also pointed out that buckwheat soba noodles are fine as food items because of the absence of wheat gluten. However, Okinawa soba noodles are the exception, since it is made from regular wheat. There is a whole back story about the Japanese community not allowing the

Okinawans from using the name 'soba' for their island noodles, and later relenting on that decision. The nutritional implication of this decision reversal needs to be noted and watched.

### Acknowledgment

This paper is dedicated to all the vegetarians in the world who do not feel a hundred percent well and who have not connected it to gluten consumption yet.

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