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‘Lactose Lullaby’

Abstract

Lactose intolerance affects many people worldwide. Not only does it limit these people’s diet, but also gives them incredibly uncomfortable symptoms when digesting products containing lactose. Among some of the symptoms not commonly known is the dreaming factor. Theory states that when lactose intolerant people ingest lactose they are at increased risk of highly vivid dreams. This is due to high levels of tryptophan, a main factor in the body’s relaxation, found in many lactose products. Lactose intolerant people are more prone to fitful sleep, causing them to wake often, increasing the likelihood of remembering these dreams. With the help of experimentation, theory may just be proven to be true.

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Being lactose intolerant can cause many symptoms, but among the less obvious is the ability to dream very vividly.

Introduction

Canada has an estimated population of 35,344,962 people. Of these, 7,000,000 people are lactose intolerant. Lactose intolerance (or lactase deficiency) is a common occurrence that causes many uncomfortable symptoms. Scientists have been researching heavily on this unfortunate diet restriction. One theory that is not as well known is the connection between dreams and lactose intolerance. **While dreams are not a consistent occurrence, when people who are lactose intolerant ingest lactose, they are more likely to experience very vivid dreams.**

Lactose Intolerance

Lactose is a complex sugar found in many dairy products, such as milk, cheese, ice cream, etc. In order to digest this sugar, the human body is responsible for producing the enzyme lactase. Lactase is a catalyst for the chemical reactions necessary for breaking down lactose. People who are lactose intolerant do not produce adequate amounts of lactase due to body complications, restricting diets, or hereditary reasons.

When diagnosing lactose intolerance, some of the symptoms doctors look for are: abdominal pain, diarrhea, flatulence, bloating, digestion and nausea. The time between the ingestions of lactose and the appearance of symptoms varies depending on the person's intake of lactose. As researchers from, British Columbia discovered, *Symptoms usually begin 30 minutes to 2 hours after you eat or drink milk products.* (healthlinkbc.ca) The variation in timing in the symptoms can add confusion to diagnosing lactose intolerance.

Lactose intolerance is incurable, but there are a few quick fixes. One foolproof way to avoid discomfort is to stick to a lactose-free diet. There are plenty of companies that offer dairy products without the unwanted sugar, such as lactose-free cheese, milk, ice cream, etc. Another option is products made with rice or almond milk. A more tedious temporary cure for lactose intolerance is to take a lactase supplement. These supplements can come in pill, liquid, drops or injection form. What these supplements do is simply put the lactase enzyme into the body to make it possible for these people to breakdown the lactose. This medication is non-prescription and can be found at almost any drug store/pharmacy.

Lactose intolerance stems from many places. Many people inherit it, but some people simply “run out” of lactase, in which their body stops producing it, due to hormonal issues. Also, statistics state that where your ancestors are from may have an effect as well. On average, 5% of European adults and a whopping 90% of Asian adults develop lactose intolerance.

Lactose Intolerance and Dreaming: The Connection

To be able to dream, humans must fall into the deepest part of their dream cycle. Humans are capable of dreaming every single night. In fact by age 60, humans have dreamt 87000 hours. The issue is remembering what the dream was upon being awoken. To do this, humans must wake up at a certain point in the dreaming process. The most vivid dreams stem from waking up at exactly the precise moment that offers the most to remember.

Symptoms of lactose intolerance are less than pleasant. They can anywhere from slightly uncomfortable to excruciatingly painful. This discomfort causes a sleep that is fitful and restless. The type of sleep results in waking up often. So, as soon as the person suffering from lactose intolerance falls into the ‘dreaming phase’ of sleep, they are woken almost immediately.

Although evidence is inconclusive about most dairy products and their connection to dreaming, the British Cheese Board in London did a study on the relationship between cheese and dreaming. In this 2005 study, it was discovered that cheese isn’t responsible for dreaming, it does indirectly induce the ability to recall the dreams. Cheese is a food notoriously known as hard to digest. Because the digestive tract is working actively to breakdown the cheese, the body is being woken up more often therefore it is more likely to be awakened during a dream. This allows for easier access to the memory of the dream. Theorists believe this is the same conclusion to be made with lactose intolerant people. However, because these people have more trouble breaking down the foods, the effect is more evident.

Tryptophan Hormone

Another connection to be made with the vividness of one’s dream and their lactose intake is a special amino acid called tryptophan, found in many foods but mostly in dairy products, seafood, legumes, nuts and seeds. An

amino acid is the building block of protein, therefore without amino acids, there cannot be proteins. Hormones or the body's microscopic messengers are primarily made of proteins. Hormones are responsible for telling the body's glands to produce or send chemicals to certain areas where they are needed. One such hormone, which uses tryptophan as its main ingredient, is serotonin. Serotonin is the body's chemical for relaxation. This hormone is very important to the human body because without it, sleep would be impossible.

It is common knowledge that it is nearly impossible to fall into slumber when the mind is highly active. The main ingredient to a sleep deep enough to dream in is relaxation. In order to rest the mind enough to relax, the body needs serotonin which, in turn, needs tryptophan. As Dr. Judith Bryans wrote, *One of the amino acids in cheese – tryptophan – has been shown to reduce stress and induce sleep.* (ianwallacedreams.com) More intake of tryptophan means that the body can produce more serotonin, granting a more tranquil state of mind. Cheese is the most beneficial to this process because the unique cultures and fungi enhance the production of tryptophan in the manufacturing process. The high tryptophan levels allow for a quicker jump in the sleep cycle, quickening the time to get to the dreaming state. This is the primary reason why cheese is known to be the most effective at inducing the most vivid dreams.

Experimentation

Besides the study done by the British Cheese Board, there was little experimentation done regarding the theory of the relationship between dreams and lactose. So in order to test out hypothetical research, an observational study was in order. Three subjects were given the task of simply ingesting a type of dairy product before turning in for the night and recording their dream experience upon being woken. Each subject was asked to ingest two foods containing lactose (one a night). One of these three was lactose intolerant and seemed to have the most conclusive results. This experiment was carried out over the course of about a week with the actual procedure being carried out on different dates throughout.

The bedtime snack varied between the subjects. The foods that were ingested were ice cream, cheese and milk. It seemed that the subjects whom ate cheese were more likely to experience vivid dreams. The subject whom ingested the ice cream experienced a dream, but not quite as vivid, while milk had little to no effect on the subjects.

As one subject stated in their questionnaire *I drank chocolate milk last night. No, I do not remember what I dreamt.*

(Subject3)

Subject 1 was lactose intolerant. On both occasions, they ate cheese before sleeping. They did remember what they dreamt each night. They state it was *much more vivid compared to the nights I avoid lactose* (Subject 1). Subject 2 and 3 were both tolerant to lactose, although they both experienced dreams more vivid than usual. Although they both ingested milk, it had no effect on either of them. Subject 2 experienced a slightly vivid dream after their consumption of ice cream, even though it was ingested earlier in the evening. Subject 3 experienced a dream that was *very vivid and weird* (Subject 3) on the night they ate cheese. Upon conversing with Subject 3 about the matter, they seemed quite frenzied at the distinct difference between the dreams they regularly encounter and the one they had after eating the cheese. However, while exchanging stories, all three subjects agree that none of the dreams were more visual and best-remembered than Subject 1 who was lactose intolerant. They seemed to be able to describe their dreams with perfect clarity, while Subjects 2 and 3 were both vague.

I do remember. My mother turned into a muffin, a plain muffin and I was a carrot. My sister later on turned into a chocolate chip. My mom didn't want to be a plain muffin anymore; she wanted to be a carrot muffin, so she came running after me, trying to eat me. Once she seen my sister (the chocolate chip) she let me go and ate her instead. Afterwards we became BFFs and went swimming together. (Subject 1)

Although this observation was one that reinforced the hypothetical theory set out by science there are a few occurrences that may have made the results a bit biased. The subjects were not given specific instructions on how much to eat of each snack. While one subject may have drunk half a glass of milk, another may have drunk the full glass. This factor may have skewed the results because increased intake of the lactose product leads to an increased intake of tryptophan which may have increased the likelihood of dreaming for one subject substantially compared to another. Also, without the specific instructions, the subjects had free reign on their choice of lactose product. Earlier research suggests cheese is more effective on producing dreams, so subjects who ingested cheese had the potential of more probability to dream more vividly. Depending on when the subjects fell asleep and when they woke up, the possible time for dreaming was varied among the subjects. For example, Subject 1 may have gotten 10 hours of sleep, while Subject 2 may have gotten 4. This affected the experiment because more time for sleep increases the likelihood of dreaming directly. This gives the subject more time to initiate the sleep cycle

necessary to dream. The subjects also may have different sleep patterns. Naturally, all humans sleep differently. Even identical twins may wake at different times during the night due to their internal clock. This factor could have impacted the experiment because some subjects just may be prone to dreaming more or less, based on their lifestyle and regular sleeping schedule.

Conclusion

Sleep is a factor in the human body that is directly impacted by the activity of the mind. The more tranquility a human feels pre-sleep increases the probability of dreaming due to the ease with which the individual will reach the dream state in the sleep cycle. Rising levels of tryptophan also help develop relaxation due to its important role in secreting serotonin, the body's natural relaxer. Products high in lactose are generally high in tryptophan as well, which allows the body to fall into a deep sleep, proven to help dream. However, because lactose intolerant people have trouble digesting these products they wake often. Their memory of the dreams is much more clear compared to lactose tolerant people because they simply have less time between the dream and alertness, which gives them less of a chance to forget what they were dreaming about. **Being lactose intolerant can cause many symptoms, but among the less obvious is the ability to dream very vividly.**

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