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Does Milk Do an Autistic Kid Body Good?

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Project Overview:

I conducted a meta study to find what previous research supported the reason why many autistic children have been prescribed a diet that is dairy free or casein free (and in many cases also a gluten free diet) by their pediatrician, family doctors or naturopaths.

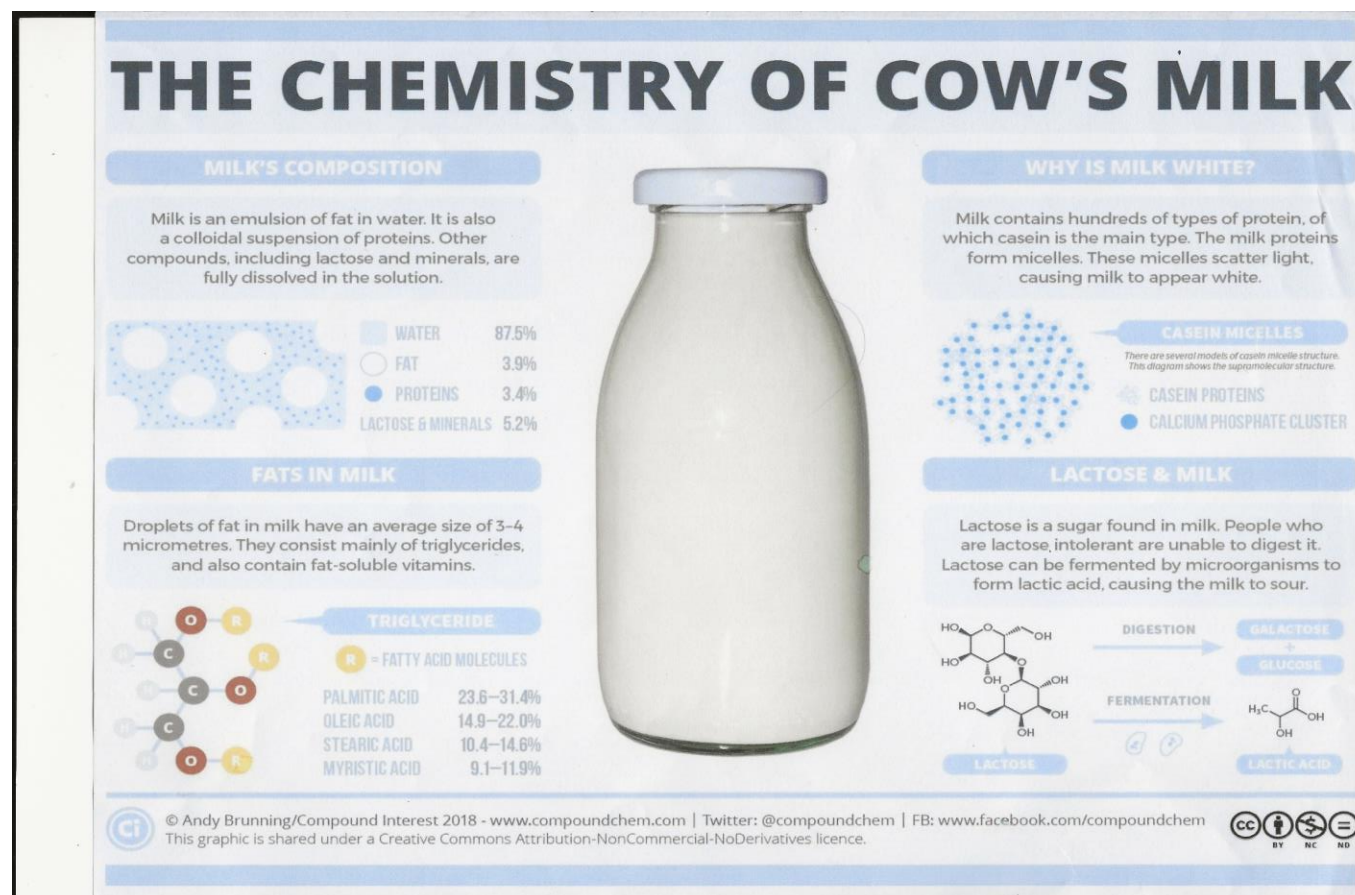
I sought to determine - what is the root cause of the recommendation?

1. Is there a link between the Autism pathogenesis in a child that is associated with the intake of dairy?
2. Is this recommendation due to some intestinal issues that have been observed?
3. Are there more significant health concerns associated with a diet that includes dairy that puts Autistic children at risk?

Process: What's in Cow's Milk? Casein and Whey Proteins Plus...

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- All 9 essential amino acids required by humans in Milk. (MilkFacts.info)
- 60% of the amino acids used to build the Milk proteins are obtained from the cow's diet. (MilkFacts.info)
- Total milk protein content and amino acid composition varies with cow breed and individual animal genetics. (MilkFacts.info)
- Cow's milk (MilkFacts.info):
 - 87.5% Water
 - 9.1% Fat, Minerals & Lactose
 - 3.4% Protein
 - 82% casein
 - 18% whey protein



(Brunnering, 2018)

Process: When Casein breaks down into Casomorphins – Trouble begins

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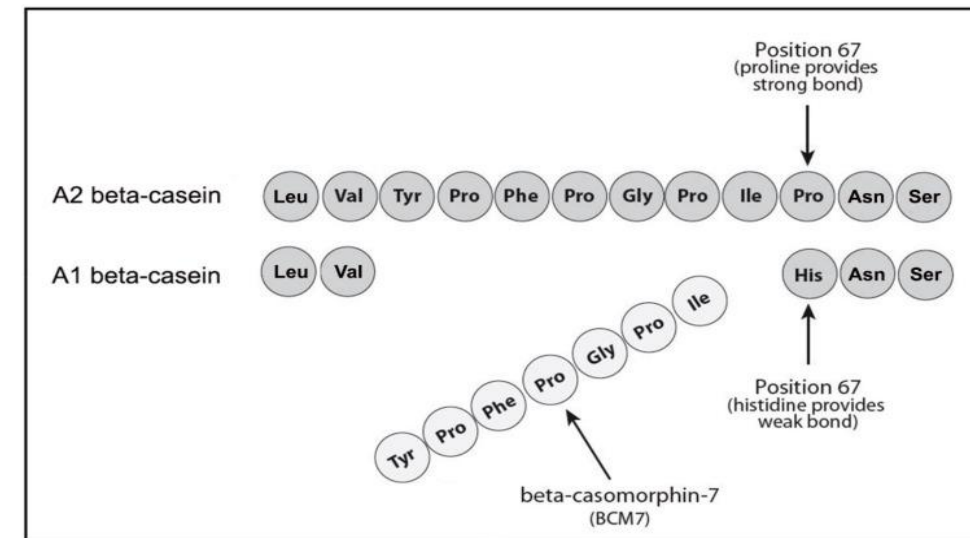
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- Several types of caseins exist in Milk (MilkFacts.info)
 - each with its own amino acid composition, genetic variations, and functional properties.
 - 209 amino acids in casein

- Milk contains beta-casein (35% by volume) - A1 & A2 (Woodford, 2021)
 - A2 beta-casein is therefore difficult to break down.
 - A2 beta-casein has potentially antihypertensive and antioxidant properties.

- Casein breaks down into Casomorphins (Woodford, 2021)
 - A1 beta-casein beta-casomorphin-7 (bBCM7) released (seen in Figure).
 - A1 from casein during digestion and can bind to opioid receptors.
 - Opioid receptors key component of internal messaging systems involving endorphins and enkephalins.



Release of bovine beta-casomorphin-7 from A1 beta-casein due to weak bond.

(Woodford, 2021)

Process: Negative Casomorphin effects from A1 beta-casein

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- Particularly noticeable in kids with Autism (Woodward, 2021)
 - Decreases in cognitive information processing, both speed and accuracy
 - Reduced response to stimuli
- Higher concentrations of A1 in blood serum and urine in Autistic children may lead to eventual discoveries of the pathogenesis of autism. (Jarmołowska et al, 2019)
- Inflammatory effects on specific tissues with possible links to (Woodward, 2021):
 - Type 1 Diabetes
 - Heart Disease
 - Influence fractures and obesity
 - Automimmune: Parkinson's and Multiple Sclerosis
 - Predisposition for asthma
 - Crossing the blood-brain barrier – possible cause of SIDS through sleep apnea
 - Intestinal Disorders

Process: Large review of 20 years of studies

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- 9 randomized controlled trials reviewed for effects of gluten and casein free diets on Autism Spectrum Disorders in children between Jan 2000 & Feb 2020 (Almari, 2020)
 - Total of 521 participants, 2-18 years old
 - Four studies did not show significant improvement regarding ASD symptoms
 - Five other studies showed improvement compared to the control group in:
 - Communication
 - Stereotyped movement
 - Aggressiveness
 - Language
 - Hyperactivity
 - Tantrums
 - Signs of ADHD
- Insufficient to support GCFD recommendation

Reference number	Duration	Ages	Sample size	Outcomes measured	Outcome
22 (United States)	3 months	2-16	15	Communication, relationships with others, activity level, tactile responsiveness, emotional expression, resistance to change, visual, auditory, social interaction, anxiety, repetitive behaviors urinary peptide levels, intellectual ability, home observation such as child responding.	Only 7 children showed improvements in child language, decreased hyperactivity and decreased tantrums.
23 (Norway)	12 months	5-10	10	Emotions sharing, peculiar gait or movements, repetitive, interaction with other children, eye contact, echolalia, language, anxiety, attachment to particular items, adult dependency, cognitive skills, linguistic abilities, and motor abilities. Communication, fear, physical contact, emotional expressions, rigidity peculiar handling toys.	A reduction in resistance to learning (example, closing the eyes, turning away from the teacher, covering the ears). Improve in peer relationship, routines and rituals.
24 (United States)	3 months	3-5	8	Intellectual development example, language and motor skills Child behavior: anxious, withdrawn, aggressive, attention Sastrointestinal symptoms: irregular bowel, diarrhea, constipation	Only improvement in aggression and the withdrawn factor
25 (Denmark)	24 months	4-10	72	Language capability, communication, social interaction, repetitive behaviors, inattention and hyperactivity, and daily living skills	Improvement in daily living skills, inattention and hyperactivity.
26 (Iran)	6 weeks	4-16	80	-Gastrointestinal outcome: diarrhea -Behavioral outcomes: social interaction, communication	Improvement in stereotyped behaviors, communication, and social interaction in intervention group compared to control group
27 (United States)	6 months	2-18	37	Social withdrawal, language, sociability, sensory, communication ,autistic isolation, speech, physical health and behavior, motor disturbances, hyperactivity items, disturbances in attention, perception, intellectual functions, inappropriate emotional. Irritability, affective responses, stereotypic behavior, inappropriate speech, cognitive awareness Urinary concentrations of beta-casomorphin	No significant difference between groups.
28 (Poland)	2 months	3-6	28	Intellectual abilities, socialization, cognitive abilities, communication, social functioning, restricted and repetitive behaviors.	No significant difference between groups.
29 (United States)	1 month	4-7	6	Hyperactivity, withdrawn, irritability, and inattention, depressed, abdominal pain, vomiting, bowel movements, cognitive skills, linguistic abilities, motor abilities, anxious, aggressive behaviors	No significant difference between groups.
30 (Indonesia)	7 days	4-7	38	Diarrhea, urinary creatinine levels, constipation, abdominal bloating, vomiting, fears, perceptual behaviors, flatulence, social problems, aggressiveness, abdominal pain, resistance to change, regulation problems, nausea	No significant difference between groups.

Table 1: Summary of the studies included in the study (Almari, 2020)

Mixed Results: Some say milk is not good especially for people including Autistic kids, some say GCFD don't necessarily help.

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- There are serious health concerns about A1 beta casein in any body, especially an Autistic body per Woodward. (2021)
- However, Alamri would say in the research survey that he conducted, the data is insufficient to support the use of a casein and gluten free diets to improve ASD symptoms. (2020)
- Jarmołowska et al focused on the concentrations (levels) of A1 beta casein in blood serum and urine in Autistic children as compared to a control group. (2019)
 - Show a difference between "healthy" and Autistic children including a gender difference
 - Conclude levels are potential factors that may lead to eventual discoveries of the pathogenesis of Autism.

Conclusion: No clear answer if Milk does an Autistic body good. There are more questions raised from doing this meta study.

- What is the effect of just a casein free diet (not including the gluten free part) on Autistic children, separating out other physiological and developmental factors? (Many Autistic children develop asynchronously)
- Are the negative effects of casein on cognitive functioning for Autistic individuals truly causal? Some of the research seems inconclusive.
- What exact enzymes do autistic people lack? What causes less digestion of these proteins, and more to show up in urine and blood serum? (Jarmołowska et al, 2019)
- What are the standard recommendations for Autistic kids for complete nutrition to ensure that the essential amino acids found in casein are ingested if casein is excluded from the diet?
 - This is an activity that can be done working with a nutritionist or registered dietician to round out the meal plan.
 - Do Autistic kids need additional amino acids or coenzymes?

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Questions?