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A2 MILK: AN INNOVATIVE APPROACH TO MENTAL AND PHYSICAL HEALTH

E. Czerniawska-Piątkowska, Professor
West Pomeranian University of Technology in Szczecin, Poland
E. Wiśniewska, Student
West Pomeranian University of Technology in Szczecin, Poland
S. Gwoździewicz, MsC
Wrocław University of Environmental and Life Sciences, Poland
M. Szewczuk, Associate Professor
West Pomeranian University of Technology in Szczecin, Poland
S. Hiller, PhD
West Pomeranian University of Technology in Szczecin, Poland
M. Wrzecińska, PhD
Wrocław University of Environmental and Life Sciences, Poland
E. Gałęska, MsC, PhD Candidate
Wrocław University of Environmental and Life Sciences, Poland
A. Kowalczyk, Associate Professor
Wrocław University of Environmental and Life Sciences, Poland
I. Kowalewska, Associate Professor
West Pomeranian University of Technology in Szczecin, Poland
R. Mylostyvyi, Candidate of Veterinary Sciences, Associate Professor
Dnipro State Agrarian and Economic University, Dnipro, Ukraine
O. Iakubchak, Doctor of Veterinary Sciences, Professor
National University of Life and Environmental Sciences of Ukraine, Ukraine
V. Kostiuk, Doctor of Veterinary Sciences, Professor
National University of Life and Environmental Sciences of Ukraine, Ukraine

Cow's milk is one of the most widely consumed sources of calcium in the human diet worldwide. Its taste is an additional factor contributing to its consumption as it provides essential nutrients that help compensate for dietary deficiencies. Milk is a source of vitamins, minerals, lipids, and proteins, which comprehensively influence the human body [1]. Milk proteins contain essential amino acids that contribute to the proper functioning of the body. Cow's milk contains two types of proteins: whey proteins and casein, with a total content ranging from 2.5% to 4.2%. Casein accounts for approximately 80% of the protein in cow's milk, with β -casein being one of its most recognizable subtypes [2]. The β -casein protein chain consists of 209 amino

acid residues, with the most common variants being A1 and A2. The A2 variant has a structure like β -casein found in human milk, making it a suitable alternative that supports optimal growth and development in infants [1]. Whey proteins make up 20-25% of the total protein content in cow's milk, with approximately 75% of them being albumins, including α -lactalbumin (α -LA), β -lactoglobulin (β -LG), and bovine serum albumin (BSA) [3]. These proteins can trigger allergic reactions in individuals sensitive to specific proteins, particularly infants and young children, due to their first exposure to foreign proteins [4]. During the digestion of A1 β -casein found in milk, a peptide called β -casomorphin-7 (BCM-7) is released. This peptide exhibits strong opioid activity, which may contribute to the development and exacerbation of certain health conditions in humans [2]. BCM-7 of the A1 type has been linked to gastrointestinal symptoms, cardiovascular disorders, and immune response alterations, leading to allergic reactions. Prolonged presence of milk in the digestive tract may cause inflammation, promote the fermentation of lactose and other oligosaccharides, and contribute to digestive discomfort. Cardiovascular issues are more frequently observed in populations consuming milk with high levels of A1 β -casein. Some researchers suspect that lactose intolerance may, in fact, be associated with the consumption of A1 milk rather than lactose itself [1,2]. A2 milk has shown positive effects on individuals with autism, as it improves responses to stimuli, enhances brain information processing, supports social interactions, and helps individuals adapt to daily life. Increasingly, diet and dairy consumption are being considered in the treatment and management of conditions such as autism and schizophrenia. The presence of A1 β -casein in cow's milk is primarily determined by genetic factors. Therefore, dairy producers and breeders can introduce the A2 allele selection criterion into breeding programs without risk [1].

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