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Abstract

Difference between the Theoretical and Analytical Content of Selected Elements in Meals Prepared for Hospital Tube Feeding †

Ivana Rumora Samarin [1,*], Anja Pozaić [1], Ivica Vrdoljak [2], Maria Đurić [1], Antonija Sulimanec [3], Ankica Sekovanić [3] and Ines Panjkota Krbavčić [1]

[1] Department of Food Quality Control, Faculty of Food Technology and Biotechnology, University of Zagreb, Pierottijeva 6, 10000 Zagreb, Croatia; avukomanovic@pbf.hr (A.P.); ipanjkota@pbf.hr (I.P.K.)
[2] Clinical Hospital Center Rijeka, Krešimirova 42, 51000 Rijeka, Croatia; ivica.vrdoljak@kbc-rijeka.hr
[3] Institute for Medical Research and Occupational Health, Ksaverska cesta 2, 10001 Zagreb, Croatia; asulimanec@imi.hr (A.S.); asekovanic@imi.hr (A.S.)
* Correspondence: irumora@pbf.hr
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Abstract: Background and objectives: Blenderized tube meals, with the proper preparation and application, can increase the nutritional variety of hospital nutrition, decrease the financial burden on the hospital system, and complement commercial enteral nutrition administration. As this type of diet is used mainly in fragile populations of patients, whose recovery depends largely on adequate nutritional intake, this study aimed to determine levels of certain elements in blenderized tube hospital meals and to compare the theoretical and obtained analytical values of those meals. Methods: Samples of 29 various freshly prepared meals based on meat (n = 13), dairy (n = 9), fruit (n = 3), and soups (n = 4) were collected in the Clinical Hospital Center Rijeka, Croatia. Those meals in different combinations make 14 daily menus consisting of three meals per day. Meals were prepared according to standard methods of thermal food processing and were blended with a mixer. Water remained after cooking was added to each meal until the proper consistency for tube feeding was achieved. The theoretical composition for each meal was calculated using the National Food Composition Database. Levels of macro-elements (Na, Mg, K, Ca) and trace (Fe) elements were determined with inductively coupled plasma mass spectrometry (ICP-MS) using Agilent 7500cx. Results: With the exception of Fe, theoretical values for all elements were from 1.3 to 2.4-fold lower in comparison to levels obtained by ICP-MS analysis. Benefits of meal consumption in term of essential elements were evaluated using the EFSA nutrient reference values. It was found that irrespective of the approach used, each of the 14 daily menus met the dietary reference values (DRV) for all elements except for Fe. Discussion: Due to the potentially insufficient intake of some microelements, one of which is Fe, dietitians and healthcare professionals should pay attention to meal composition when planning daily menus for tube-fed patients. For Na, intake should be reduced to prevent the development of chronic non-communicable diseases. Further studies should be conducted to determine if the national food composition database needs to be revised for micronutrient content.

Keywords: hospital diet; elements; enteral nutrition; ICP-MS; tube feeding

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