BOOK OF ABSTRACTS

International conference on new knowledge on chemical reactions during food processing and storage

CHEMICAL REACTIONS IN FOODS VII

November 14–16, 2012
Prague, Czech Republic

J. Pulkrabová, M. Tomaniová, V. Godulová, K. Cejpek and J. Hajšlová
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INSTITUTE OF CHEMICAL TECHNOLOGY PRAGUE

VÚPP

EuChemS DIVISION OF FOOD CHEMISTRY

ČCHS

Miroslav M., Nov. 14th, 2012, Prague

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CHEMICAL REACTIONS IN FOODS VII

November 14–16, 2012 • Prague • Czech Republic

Masaryk College Conference Centre

Organized by:

Institute of Chemical Technology, Prague, Czech Republic
Department of Food Analysis and Nutrition
&
Food Research Institute Prague, Czech Republic
&
Czech Chemical Society
Section of Food and Agricultural Chemistry
&
European Association for Chemical and Molecular Sciences
Food Chemistry Division

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Compounds associated with nutritional and sensory quality of foods

C-100

INTERACTION OF ADDED INORGANIC IRON(II) WITH MILK BABY FORMULA INGREDIENTS

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Addition of iron in milk baby formula is common practice in their production, because the basic raw material does not contain enough of these essential trace elements. Iron(II) sulfate is most often used as inorganic source of iron. Biological availability of iron depends of iron's oxidation number and type of compound used. During production of milk formula in powder form out of solution, changes of added iron(II) out of sulfate happen during the production process and later on during dissolution of powder for preparation of meals. In this work are shown the research results of interactions between inorganic iron and other ingredients in three different domestic milk baby formulas. Distribution of iron in solution and in form of particles, which could be separated by centrifugation, is approx. 30% i.e. 70%, respectively. Iron in sediment is agglomerate of base-iron(III)-proteinate, and in supernatant is iron(II)-ion dominant. Presumption is that biological availability of iron is greater from solution. The results of this examination on study of iron speciation in researched products, studies that are currently taking place, will contribute with evaluation of biological value of added iron.

Keywords: Iron addition, iron form, milk baby formula

Acknowledgement: *Serbian Ministry of Education, Science and Technological Development*

INTERACTION OF ADDED INORGANIC IRON(II) WITH MILK BABY FORMULA INGREDIENTS

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Backround:

Addition of iron in milk baby formula is common practice in their production, because the basic raw material does not contain enough of these essential trace elements. Iron(II) sulfate is most often used as inorganic source of iron. Biological availability of iron depends of iron's oxidation state and type of compound used. During production of milk formula in powder form out of solution, changes of added iron(II) out of sulfate happen during the production process and later on during dissolution of powder for preparation of meals.

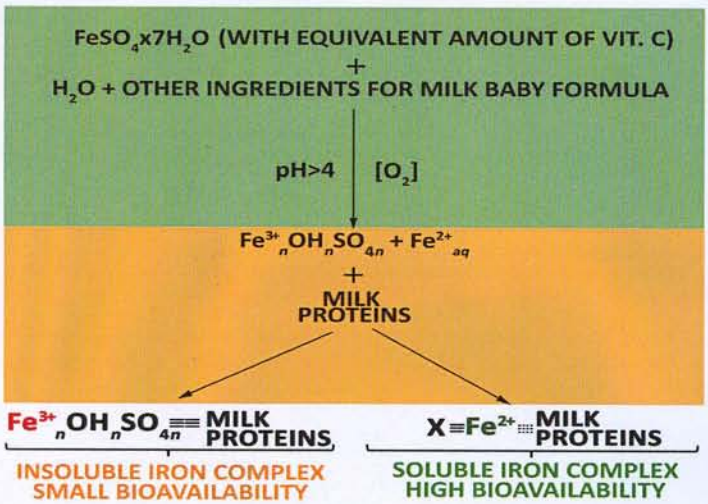

Figure 1.
THE MOST PROBABLY REACTION BETWEEN INORGANIC IRON AND OTHER INGREDIENTS

Material & Methods:

Three products of domestic milk baby formula were used: Mil 1 (Infant formula, 0-6 months), Mil 2 (follow-on formula, 6-12 months) and Mil 3 (growing up milk, after 12 months). 50 mL od each ready-for-use product were centrifuged at 6000 rpm for 20 min at 4°C. Total Fe content in products and Fe content of supernatants were analyzed by ICP.

Results:

In this work are shown the research results of interactions between inorganic iron and other ingredients in three different domestic milk baby formulas. Distribution of iron in solution and in form of particles, which could be separated by centrifugation, is approx. 30 % *i.e.* 70 %, respectively. Iron in sediment is agglomerate of base-iron(III)-proteinate, and in supernatant is iron(II)-ion dominant. Presumption is that biological availability of iron is greater from solution.

Table 1.
AVERAGE COMPOSITION OF BABY MILK FORMULAS

Product/Nutritional values [g/100g powder]	Mil 1	Mil 2	Mil 3
Proteins	10.7	12.4	10.5
Total fats	25	24	18
Total carbohydrates	57.2	53.9	53
Lactose	50	46.5	38.2
Natural dietetic fibres	2.9	4.5	3.5
Mineral components	2.9	3.66	2.4

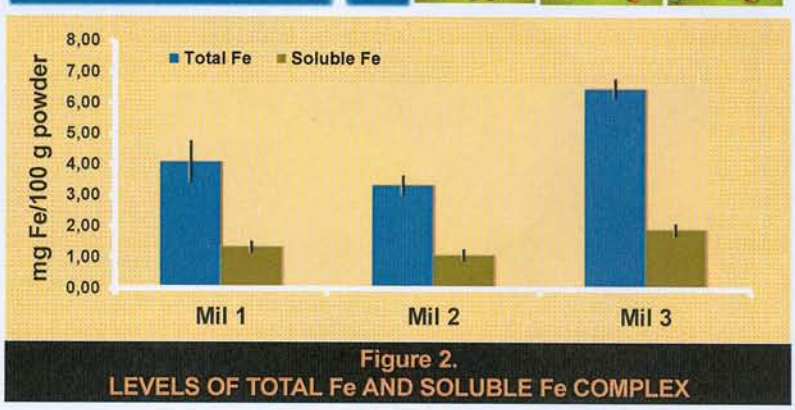

Figure 2.
LEVELS OF TOTAL Fe AND SOLUBLE Fe COMPLEX

Conclusions:

The results of this examination on study of iron speciation in researched products, studies that are currently taking place, will contribute with evaluation of biological value of added iron.

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FCUB ERA FP7 and Serbian Ministry of Education, Science and Technological Development (Project no. III 43004)

Prague, November 16, 2012

CERTIFICATE OF PARTICIPATION

CHEMICAL REACTIONS IN FOODS VII (CRF 2012)

This is to certify **Miroslav VRVIC**, participated in the 7th International conference on **Chemical Reactions in Foods (CRF 2012)** (www.crf2012.eu), organized jointly by the Institute of Chemical Technology, Prague (ICT Prague), Food Research Institute Prague (VÚPP), Czech Chemical Society (ČSCH) and European Association for Chemical and Molecular Sciences, Food Chemistry Division (EuCheMS) on November 14–16, 2012, in Masaryk College Conference Centre, Prague, Czech Republic.

With compliments,

Jana Hajšlová

Prof. Jana Hajšlová, PhD
CRF 2012 chairwoman