NASPGHAN
714 N Bethlehem Pike
Suite 300
Ambler, PA 19002
215-641-9800



NORTH AMERICAN SOCIETY FOR PEDIATRIC GASTROENTEROLOGY, HEPATOLOGY AND NUTRITION

November 19, 2018

Comment to the United States Food and Drug Administration
RE: Docket No. FDA-2018-3522 for "Use of the Names of Dairy Foods in the Labeling of Plant-Based Products"
From the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition (NASPGHAN) and the Council for Pediatric Nutrition Professionals (CPNP)

Members of The North American Society for Pediatric Gastroenterology, Hepatology and Nutrition (NASPGHAN) are Board Certified Pediatric Gastroenterologist physicians who care for children with a broad spectrum of gastrointestinal disorders including primary nutrition and secondary nutrition disorders related to gastrointestinal, liver and other diseases. The Council for Pediatric Nutritional Professionals (CPNP) is an associated group of certified dietetic professionals serving a similar patient base. We are pleased to see the FDA request for comments regarding plant-based foods that may be labelled or used like milks. Our interest in this topic stems from increased consumption of these alternatives in recent years[1,2], our clinical experience and a large body of published literature related to adverse clinical effects when certain non-standardized plant-based beverages have been used inappropriately in lieu of standardized milk products in the feeding of infants and children[3]. Such product use places children at risk of slowed growth[4], protein-calorie malnutrition, failure to thrive and specific nutrient deficiencies, such as vitamin D[5], compromising current and future health and development. In addition, there are concerns that high intakes of some plant-based products may lead to excessive toxin intake, such as arsenic from rice-based milks[6]. Further, enterocolitis has long been known to be possible in cow milk protein intolerant infants or children fed soy formulas or milk, but may also occur with some other plant-based milk products[7-9]. Due to such concerns, the European Society for Pediatric Gastroenterology Hepatology and Nutrition recommends the use of an infant formula for the first two years of life in children who cannot consume cow milk rather than other milk substitutes[10].

The universally preferred milk for infants is human milk[11], but there are many infants fed infant formula due to maternal choice or other complex factors[12]. U.S. infant formulae are regulated under the Infant Formula Act that requires that products labelled as infant formula support healthy growth. Since introduction of the Infant Formula Act, reports of nutritional deficiencies related to US formulas have become exceedingly rare. By one year of age, most infants are weaned to some form of "milk." USDA recommendations are for intake of 2-3 servings of dairy products/day for a well-balanced,

nutritionally complete diet, which encompasses approximately 25-30% of total energy needs of 1-3 year-olds. Most infants and children tolerate cow milk-based formulae and milks with only 2-7.5% of infants and young children having true cow milk protein intolerance[13]. These infants and children suffer adverse medical consequences from consuming cow milk-based infant formulae and standardized milk products. For these children, nutritious infant formulae and alternative beverages are needed, and have become widely available. When a hypoallergenic or cow milk-free milk substitute is needed, some vegetable-based products may be attractive alternatives to consumers, but may not prove hypoallergenic and may not provide necessary nutrition. There are also aroma, taste and texture differences between alternative products and cow milk that may influence choices among hypoallergenic or plant-based cow milk alternatives[14]. Financial considerations can also play a role in substitution decisions. The cost of expensive, hypoallergenic infant formulas is not uniformly covered by health insurers, as they are nutritional products, not drugs and this may have health consequences[15]. In addition to caring for milk-intolerant infants and children who require a cow milk alternative, we increasingly see families with religious or cultural values that preclude cow milk intake, or who have strong a preference to avoid cow milk[12], which lead them to seek alternatives.

The FDA currently defines “milk” and related milk products by the product source and the inherent nutrients provided by bovine milk[16]. There is insufficient consumer recognition of why some milk alternatives meet pediatric nutritional needs and others do not. In our clinical experience, consumers and mothers understand what standardized milk products are (with varying degrees of understanding of the nutrition provided by milk), but also may see “milk” as a white beverage given to children as a source of fluid and nutrition. There are potential health risks when this second understanding leads to selection of a nutritionally inferior “milk” with resultant inadequate nutritional intake from the total diet[17,18]. The misguided substitution of a plant-based “milk” for cow milk, without adequate compensation for nutrients not supplied in those products, can place a child at risk. Breastmilk or infant formula (most commonly containing cow milk), is an infant’s sole food for the first 4 to 6 months, and milk beverages continue to play an important role in providing infant and childhood nutrition because of the high nutritional value of milk with its calories, protein content, minerals and other nutrients. Substitution of a milk that does not provide similar nutrition is deleterious to a child’s nutritional status[19], growth and development. Table 1 highlights nutritional differences between cow milk and plant-based nontraditional “milks.” Figure 1 provides examples of plant-based “milk” and cow milk labels. Even among products based on the same plant source, there may be substantial nutrient content differences. In the absence of informative food labeling and clear standards of identity, consumers with strong dietary preferences and good intentions may be led to select a nutritionally inferior “milk,” believing that one product labeled as “milk” is nutritionally equivalent to another.

**Nutritional Comparison of Cow's Milk and Plant-Based "Milks"**

| Per 1 cup (240mls) | Cow's Milk | Vegetable Milks* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Almond | Cashew | Coconut | Flax-Seed | Hemp | Oat | Pea | Rice | Soy |
| Calories | 150 | 30-100 | 25-80 | 45-90 | 55 | 70-170 | 130 | 115 | 110 | 90 |
| Protein (g) | 8 | 1-5 | 0-1 | 0-1 | 0 | 2-4 | 4 | 8 | 1 | 6 |
| Fat (g) | 8 | 3 | 2-3.5 | 5 | 2.5 | 5-6 | 2.5 | 5 | 2.5 | 3.5 |
| Carbohydrates (g) | 13 | 9-22 | 1-20 | 8-13 | 9 | 1-35 | 24 | 11 | 20 | 15 |
| Sugars (g) | 12 | 7-20 | 0-18 | 0-9 | 9 | 0-23 | 19 | 10 | 13 | 9 |
| Calcium (mg) | 300 | 300 | 100-450 | 100-450 | 300 | 400 | 350 | 450 | 300 | 400 |
| Vitamin D (IU) | 120 | 110 | 125 | 125 | 100 | 150 | 120 | 150 | 120 | 120 |

*There are variations with non-dairy milk nutrients due to different products available; averages or ranges are reported.

**Figure 1. Labels of cow milk and plant-based "milks"**


A. Cow milk, B. Soy milk, C. Coconut milk; D. Almond milk, E. Rice milk, F. Pea milk

Examples of adverse effects from the misuse of certain plant-based beverages have been well-documented and include failure to gain weight, decreased growth in stature, electrolyte disorders, kidney stones[20], severe nutrient deficiencies[3] including protein calorie malnutrition with edema (kwashiorkor)[21], iodine deficiency[22,23], iron deficiency anemia, rickets and scurvy, and the known risks for developmental damage related to malnutrition occurring during infancy and early childhood[24]. Tables 2, 3 and 4 reproduced from a 2017 publication by Dr. Isidro

Vitoria with his permission document more than 30 such cases described in the US and international medical and nutritional literature in the past 30 years[3]. Many more such cases are seen in clinical practice, but not documented by publication.

**Table II.** Published clinical cases of nutritional problems associated with soy beverages consumed by infants and toddlers

| Authors Year | Reasons for introduction of soy beverage | Age of introduction of soy beverage (age of diagnosis) | Characteristics of feeding | Daily intake | Laboratory findings | Diagnosis |
|---|---|---|---|---|---|---|
| Carvalho NF et al. (6) 2001 | Taste preference<br>Breastfeeding without vitamin D supplement | 10 months<br>(17 months) | Soy beverage, vegetables, fruits | 900 ml | Ca 2.22 mmol/l<br>P 0.55 mmol/l<br>AP 1879 U/l<br>VitD 19.2 nmol/l<br>PTH 12.1 pmol/l | Rickets<br>Failure to thrive |
| Fox AT et al. (16) 2004 | Breastfeeding without vitamin D supplement<br>Urticaria with infant formula at 6 months | 6 months<br>(14 months) | Breastfeeding, soy beverage, vegetables, fruits | -- | Ca 1.71 mmol/l<br>P 1.06 mmol/l<br>AP 2054 U/l<br>VitD 15 nmol/l<br>PTH 44.1 pmol/l | Rickets<br>Failure to thrive<br>Ferropenic anemia |
| Imataka G et al. (17) 2004 | Eczema at 3 weeks<br>Parental decision | 1 month<br>(5 months) | Soy beverage<br>Calcium: 28.9 mg/l<br>No vitamin D | -- | Ca 1.32 mmol/l<br>P 1.6 mmol/l<br>AP 2303 U/l<br>VitD 19.9 nmol/l PTH 254 pmol/l | Hypocalcemic tetany<br>Rickets<br>Failure to thrive |

*AP: Alkaline phosphatase; Ca: Calcium; P: Phosphorus; PTH: Parathyroid hormone; VitD: 25-OH-vitamin $D_3$*

**Table III.** Published clinical cases of nutritional problems associated with rice beverages consumed by infants and toddlers

| Authors Year | Reasons for introduction of rice beverage | Age of introduction of rice beverage (age of diagnosis) | Characteristics of feeding | Daily intake | Laboratory findings | Diagnosis |
|---|---|---|---|---|---|---|
| Massa G et al. (24) 2001 | Dermatitis unimproved with a soy formula (homeopathic physician) | 16 weeks (33 weeks) | Rice beverage Fruits, vegetables | RB: 1.0-1.38 l | Alb 26 g/l | Kwashiorkor |
| Carvalho NF et al. (6) 2001 | Eczema and perceived milk intolerance | 13-15 months? (22 months) | Rice beverage Vegetables | RB: 1.5 l 0.3 g prot/kg/d 79 kcal/kg/d | Alb 10 g/l Zinc 32.2 µg/dl | Kwashiorkor |
| Liu T (25) 2001 | Perceived intolerance of formula | ? (4 months) | Rice beverage Vitamins | -- | Alb 14 g/l TProt 29 g/l Zinc 22 µg/dl | Kwashiorkor |
| Novembre E et al. (26) 2003 | Atopic dermatitis (naturopathic doctor) | 5 months (6 months) | Rice beverage, rice cream, vegetables, fruits | RB: 660 ml 0.5 g prot/kg/d 86 kcal/kg/d | Alb 14 g/dl TProt 28 g/l | Kwashiorkor |
| Kuhl J et al. (27) 2004 | Atopic dermatitis positive RAST to multiple foods | 14 months (17 months) | Rice beverage, 1-2 tablespoons of baby food | 5 g prot/d 600 kcal/d | Alb 12 g/l TProt 35 g/l Zinc 27 µg/dl | Failure to thrive Kwashiorkor |
| Katz K et al. (28) 2005 | Breastfed 8 m Rejection of infant formula | 8 months (14 months) | Rice beverage, meat, vegetables | -- | Alb 14 g/l TProt 36 g/l Zinc 28 µg/dl | Kwashiorkor |
| Katz K et al. (28) 2005 | Rejection of infant formula | 2 months (7 months) | Rice beverage, baby food, iron supplementation | -- | Alb 15 g/l TProt 34 g/l Zinc 31 µg/dl | Failure to thrive Kwashiorkor |
| Barreto-Chang OL et al. (29) 2010 | Cow's milk allergy | 13 months (16 months) | Rice milk (0.4 g proteins/100 ml) | -- | VitD 9 nmol/l PTH 20.4 pmol/l | Failure to thrive Rickets |
| Tierney E et al. (30) 2010 | Scalp rash | 4 months (8 months) | Rice milk, bananas, sweet potatoes | -- | Alb 20 g/l TProt 37 g/l Zinc 91.5 µg/dl | Kwashiorkor |
| Diamanti A et al. (31) 2011 | Cow's milk allergy (3 cases) | 3 months (4 months) 1.5 months (4 months) 3 months (5 months) | Rice beverage | -- | Alb < 20 g/l TProt < 40 g/l | Kwashiorkor |

*(Continue in the next page)*

**Table III (Cont.).** Published clinical cases of nutritional problems associated with rice beverages consumed by infants and toddlers

| Authors Year | Reasons for introduction of rice beverage | Age of introduction of rice beverage (age of diagnosis) | Characteristics of feeding | Daily intake | Laboratory findings | Diagnosis |
|---|---|---|---|---|---|---|
| Keller MD et al. (32) 2012 | Eczema. Allergy to cow's milk, soy, egg, peanut, etc. | 13 months (19 months) | Rice beverage, rice, potatoes, carrots | -- | Alb 16 g/l TProt 33 g/l | Kwashiorkor |
| Keller MD et al. (32) 2012 | Suspected cow's milk allergy (eczema, vomiting) | 12 months (16 months) | Rice beverage Lentils, chick-peas, olives | -- | Alb 12 g/l Hb 7 g/dl | Kwashiorkor Anemia |
| Fourreau D et al. (33) 2013 | Suspected cow's milk allergy (naturopathic doctor) | 7 months (9 months) | Rice beverage (0.1 g prot/100 ml), fruits, vegetables | RB:800-900 ml | Alb 7 g/l Hb 10 g/dl | Kwashiorkor Anemia |
| Fourreau D et al. (33) 2013 | Suspected cow's milk allergy (parental decision) | 13 months (14.5 months) | Rice beverage | RB: 300 ml | Alb 7 g/l Hb 3.5 g/dl Vit $B_{12}$ 143 ng/l | Failure to thrive anemia |
| Le Louer B et al. (5) 2014 | Vomiting | 2 months (4.5 months) | Rice beverage | -- | Hb 5.7 g/dl Alb 1.8 g/dl Zinc 3.5 µmol/l | Failure to thrive anemia |
| Le Louer B et al. (5) 2014 | Eczema | 1 months (7 months) | Rice beverage | -- | Hb 8.7 g/dl Alb 1.98 g/dl Zinc 3.9 µmol/l | Failure to thrive Kwashiorkor Anemia |
| Mori et al. (34) 2015 | Atopic dermatitis (naturopathic doctor) | 4 months (6 months) | Rice milk, fruits, rice poultry and vegetable broth. | -- | Alb 13 g/l TProt 30 g/l Hb 5.7 g/dl | Kwashiorkor Anemia |

*Alb: Albumin; Hb: Hemoglobin; PTH: Parathyroid hormone; RB: rice beverage; TProt: total protein; VitD: 25-OH-vitamin $D_3$.*

**Table IV.** Published clinical cases of nutritional problems associated with almond beverages consumed by children

| Authors Year | Reasons for introduction of almond beverage | Age of introduction of almond beverage (Age of diagnosis) | Characteristics of feeding | Daily intake | Laboratory findings | Diagnosis |
|---|---|---|---|---|---|---|
| Kanaka C et al. (36) 1992 | Eczematous reaction to cow's milk formula (maternal decision) | 2.5 months (7.5 months) | Self-prepared extract of almonds Cereals Fruits | 98% DRI proteins 54% DRI energy | TSH 378 µIU/ml Iodine 47 nmol/l Free carnitine 12 µmol/l | Failure to thrive Iodine and carnitine deficiency |
| Mesa O et al. (37) 2009 | -- | Birth (31 days) | Almond beverage | -- | Cl- 94 mmol/l Na+ 136 mmol/l K+ 3 mmol/l $CO_3H$- 40.3 mmol/l | Dehydration Metabolic alkalosis |
| Mesa O et al. (37) 2009 | -- | Birth (4 months) | Almond beverage | -- | Cl- 74 mmol/l Na+ 124 mmol/l K+ 2.2 mmol/l $CO_3H$- 49.8 mmol/l | Metabolic alkalosis |
| Fourreau D et al. (33) 2013 | Suspected gastro-esophageal reflux | 12 months (13 months) | Almond beverage (17 mg sodium/100 ml; 24 mg chloride/100 ml) Yogurt Vegetables | 840 ml | Cl- 69 mmol/l Na+ 127 mmol/l K+ 1.9 mmol/l $CO_3H$- 48 mmol/l | Metabolic alkalosis |
| Doron D et al. (38) 2013 | Diarrhea and vomiting attributed by the mother to cow's milk protein allergy | 4 months (6 months) | Almond-based home made "formula" (Almond 10 g/water 100 ml) | 1,000 ml | Ca 1.4 mmol/l P 1.2 mmol/l AP 818 U/l vitD < 12 nmol/l PTH 30.3 pmol/l Hb 7.7 g/dl | Failure to thrive Rickets Anemia |
| Doron D et al. (38) 2013 | Rash | 4-5 months (8 months) | Almond-based and honey home made "formula" (20 gr almonds / 100 ml water) | 600 mL | Alb 20 g/l TProt 36 g/l | Kwashiorkor |
| Le Louer B et al. (5) 2014 | Gastro-esophageal reflux, eczema | 3.5 months (5 months) | Almond and chestnut beverage | - | Alb 19.5 g/l Ca 0.64 mmol/l Zinc 7 µmol/l | Hypocalcemic tetany Malnutrition |

*(Continue in the next page)*

**Table IV (Cont.).** Published clinical cases of nutritional problems associated with almond beverages consumed by children

| Authors Year | Reasons for introduction of almond beverage | Age of introduction of almond beverage (Age of diagnosis) | Characteristics of feeding | Daily intake | Laboratory findings | Diagnosis |
|---|---|---|---|---|---|---|
| Le Louer B et al. (5) 2014 | Parental decision | 8.5 months (16.5 months) | Almond and walnuts beverage | -- | VitD < 12.5 nmol/l Ca 2.32 mmol/l P 1.71 mmol/l PTH 8.8 pmol/l | Rickets |
| Ellis D et al. (39) 2015 | Tourette syndrome (1 case) Lactose intolerance (2 cases) | 3 years 9 years 10 years | Almond milk and varied diet | 700-1,000 ml | Urine oxalate 53.5, 81.5 and 97.9 mg/1.73 $m^2$/d (27.6-35.4) | Hyperoxaluria Hematuria (2 cases) Kidney stones (1 case) |
| Vitoria I et al. (7) 2016 | Medical indication (atopic dermatitis) | 2.5 months (11 months) | Almond milk Almond flour Cereals | 840 ml/d | Ascorbic acid < 10 µmol/l VitD 31 nmol/l | Scurvy |

*Alb: Albumin; Ca: Calcium; Hb: Hemoglobin; P: Phosphorus; TProt: total protein; VitD: 25-OH-vitamin $D_3$.*

We believe such adverse nutritional outcomes are preventable through FDA mandated labeling of non-standardized plant-based beverages, consumer nutrition education and efforts directed to heighten health care practitioners' awareness of these nutritional issues. These challenges are not limited to the US. Codex Alimentarius similarly defines milk as coming from an animal lacteal source, but reported cases of children with nutritional compromise related to the inappropriate use of plant-based milks come not just from the US, but also from other high-income countries that use the Codex Alimentarius as the basis of their food regulation.

A food labeling challenge is that "good nutrition" has varying meanings to different segments of the population. To some, good nutrition means generally following Dietary Guidelines for the

various age groups with foods that have long been part of the American diet. To others, it may relate more to the avoidance of specific foods or food components (e.g., animal-derived food products, cow milk or gluten) or the avoidance of toxins, food additives or genetically modified foods and ingredients. Food labeling needs to provide information to facilitate appropriate food choices based on personal preferences as to ingredients and ingredient sources, nutrient content and the role of specific foods in meeting daily dietary requirements, all in the small space of the food label.

Based on our clinical experience and the available relevant medical literature, we believe that labelling a product as "milk" that: 1) does not come from cow milk, or 2) does not contribute the nutritional value of milk to the diet[18,25], is not in consumers' interests. For plant-based products with a nutritional composition that requires extensive fortification[14] (e.g., calcium) to achieve a nutritional label value approximating that of "milk," it is difficult to know to what extent the actual nutritional value of milk is achieved, in the absence of bioavailability studies[18]. The biologic value of the protein source and its physical matrix relative to cow milk also needs to be considered in this regard[14,26,27]. Similarly, there may be physical stability issues with such products that require extensive shaking or special handling or instructions[14]. From a pediatric medical and nutritional standpoint, it is advisable that "milk" be: 1) milk products as currently defined by FDA, or 2) provide comparable nutritional value to standard "milk". Such labeling, and education regarding this labeling, may reduce adverse nutritional effects from consuming nutritionally non-equivalent plant-based products labeled as "milk."

Russell J. Merritt, MD, PhD, FAAP
On behalf of the Nutrition Committee of NASPGHAN and the CPNP

References cited:


1. Mintel Press Team. US Non-dairy milk sales grow 61% over the last 5 years. Mintel.com; January 4, 2018.
2. Bridges M. Moo-ove Over Cow's Milk. The Rise of Plant-based Dairy Alternatives. Practical Gastroenterology 2018:20-7.
3. Vitoria I. The nutritional limitations of plant-based beverages in infancy and childhood. Nutr Hosp 2017;34:1205-14.
4. Morency ME, Birken CS, Lebovic G, et al. Association between noncow milk beverage consumption and childhood height. Am J Clin Nutr 2017;106:597-602.
5. Lee GJ, Birken CS, Parkin PC, et al. Goat's Milk, Plant-based Milk, Cow's Milk, and Serum 25-hydroxyvitamin D Levels in Early Childhood. Epidemiology 2016;27:e29-31.
6. Lai PY, Cottingham KL, Steinmaus C, Karagas MR, Miller MD. Arsenic and Rice: Translating Research to Address Health Care Providers' Needs. J Pediatr 2015;167:797-803.
7. Caminiti L, Salzano G, Crisafulli G, Porcaro F, Pajno GB. Food protein induced enterocolitis syndrome caused by rice beverage. Ital J Pediatr 2013;39:31.
8. Mehr S, Kakakios A, Frith K, Kemp AS. Food protein-induced enterocolitis syndrome: 16-year experience. Pediatrics 2009;123:e459-64.
9. Vitoria JC, Camarero C, Sojo A, Ruiz A, Rodriguez-Soriano J. Enteropathy related to fish, rice, and chicken. Arch Dis Child 1982;57:44-8.

10. Koletzko S, Niggemann B, Arato A, et al. Diagnostic approach and management of cow's-milk protein allergy in infants and children: ESPGHAN GI Committee practical guidelines. J Pediatr Gastroenterol Nutr 2012;55:221-9.
11. Lessen R, Kavanagh K. Position of the academy of nutrition and dietetics: promoting and supporting breastfeeding. J Acad Nutr Diet 2015;115:444-9.
12. McCarthy KS, Parker M, Ameerally A, Drake SL, Drake MA. Drivers of choice for fluid milk versus plant-based alternatives: What are consumer perceptions of fluid milk? J Dairy Sci 2017;100:6125-38.
13. Mousan G, Kamat D. Cow's Milk Protein Allergy. Clin Pediatr (Phila) 2016;55:1054-63.
14. Makinen OE, Wanhalinna V, Zannini E, Arendt EK. Foods for Special Dietary Needs: Non-dairy Plant-based Milk Substitutes and Fermented Dairy-type Products. Crit Rev Food Sci Nutr 2016;56:339-49.
15. Mehta H, Ramesh M, Feuille E, Groetch M, Wang J. Growth comparison in children with and without food allergies in 2 different demographic populations. J Pediatr 2014;165:842-8.
16. Title 21—Food and Drugs Chapter 1—Food and Drug Administration Department of Health and Human Services Subchapter B—Food for human Consumption. 21:CFR131110;2.
17. Vanga SK, Raghavan V. How well do plant based alternatives fare nutritionally compared to cow's milk? J Food Sci Technol 2018;55:10-20.
18. Singhal S, Baker RD, Baker SS. A Comparison of the Nutritional Value of Cow's Milk and Nondairy Beverages. J Pediatr Gastroenterol Nutr 2017;64:799-805.
19. Meyer R, De Koker C, Dziubak R, et al. The impact of the elimination diet on growth and nutrient intake in children with food protein induced gastrointestinal allergies. Clin Transl Allergy 2016;6:25.
20. Ellis D, Lieb J. Hyperoxaluria and Genitourinary Disorders in Children Ingesting Almond Milk Products. J Pediatr 2015;167:1155-8.
21. Centers for Disease C, Prevention. Severe malnutrition among young children--Georgia, January 1997-June 1999. MMWR Morb Mortal Wkly Rep 2001;50:224-7.
22. Ma W, He X, Braverman L. Iodine Content in Milk Alternatives. Thyroid 2016;26:1308-10.
23. Bath SC, Hill S, Infante HG, Elghul S, Nezianya CJ, Rayman MP. Iodine concentration of milk-alternative drinks available in the UK in comparison with cows' milk. Br J Nutr 2017;118:525-32.
24. Black RE, Allen LH, Bhutta ZA, et al. Maternal and child undernutrition: global and regional exposures and health consequences. Lancet 2008;371:243-60.
25. Melina V, Craig W, Levin S. Position of the Academy of Nutrition and Dietetics: Vegetarian Diets. J Acad Nutr Diet 2016;116:1970-80.
26. Food and Agriculture Organization of the United Nations WHO. Dietary protein quality evaluation in human nutrition; Report of an FAO Expert Consultation. 2013:66.
27. Rutherfurd SM, Fanning AC, Miller BJ, Moughan PJ. Protein digestibility-corrected amino acid scores and digestible indispensable amino acid scores differentially describe protein quality in growing male rats. J Nutr 2015;145:372-9.