



# Food neophobia and its association with intake of fish and other selected foods in a Norwegian sample of toddlers: A cross-sectional study



Sissel H. Helland\*, Elling Bere, Helga Birgit Bjørnarå, Nina Cecilie Øverby

Department of Public Health, Sport and Nutrition, Faculty of Health and Sport Sciences, University of Agder, Norway

## ARTICLE INFO

### Article history:

Received 29 June 2016

Received in revised form

8 March 2017

Accepted 16 March 2017

Available online 18 March 2017

### Keywords:

Toddler

Food neophobia

Food intake

Nutrition

Fish

## ABSTRACT

Reluctance to try novel foods (food neophobia) prevents toddlers from accepting healthy foods such as fish and vegetables, which are important for child development and health. Eating habits established between ages 2 and 3 years normally track into adulthood and are therefore highly influential; even so, there are few studies addressing food neophobia in this age group. This cross-sectional study investigated the relationship between the level of food neophobia and the frequency of toddlers' intake of fish, meat, berries, fruit, vegetables, and sweet and salty snacks. Parents of 505 toddlers completed a questionnaire assessing the degree of food neophobia in their toddlers (mean age 28 months,  $SD \pm 3.5$ ), and frequency of intake of various foods. Food neophobia was rated by the Children's Food Neophobia Scale (CFNS, score range 6–42). Associations between CFNS score and food frequency were examined using hierarchical multiple regression models, adjusting for significant covariates. Toddlers with higher CFNS scores had less frequent intake of vegetables ( $\beta = -0.28, p < 0.001$ ), berries ( $\beta = -0.17, p = 0.002$ ), fruits ( $\beta = -0.16, p < 0.001$ ), and fish ( $\beta = -0.15, p = 0.001$ ). No significant associations were found for CFNS score and frequency of toddlers' intakes of meat or of sweet and fatty snacks. These findings suggest that food neophobia in toddlers is associated with lower diet quality, and indicate a need for intervention studies to address the food neophobia.

© 2017 Elsevier Ltd. All rights reserved.

## 1. Introduction

Some toddlers are unwilling to taste and accept new foods that might be important for normal and healthy development and later health (Blissett & Fogel, 2013; Carruth et al., 1998). Eating behaviors such as foods preferred, accepted, and consumed, are established at an early age and these habits often track into adulthood (Birch, 1999; Birch & Ventura, 2009; Kelder, Perry, Klepp, & Lytle, 1994), thus assuming utmost importance for future health. Unfortunately, reluctance to try novel foods (food neophobia) can prevent toddlers from exploring unfamiliar foods, which in turn can contribute to

restriction in the number of foods liked (Perry et al., 2015). Furthermore, liking of foods influences food intake (Yuan et al., 2016), and some researchers suggest that food neophobia is the strongest psychological barrier to increased food variety in children (Birch & Fisher, 1998; Falciglia, Couch, Gribble, Pabst, & Frank, 2000).

Three foundational reasons for rejection of foods have been proposed: 1) dislike of their sensory characteristics; 2) danger, i.e., a fear of negative consequences of eating them; and 3) disgust arising from the idea of the food's nature or origin (Pliner & Salvy, 2006). Food neophobia starts at about 2 years of age, peaking between 2 and 6 years, and gradually decreasing with age into a relatively stable level in adulthood (Dovey, Staples, Gibson, & Halford, 2008). Food neophobia is an evolutionary survival mechanism that helps toddlers, who have begun to walk and explore their environment, to avoid foods that might be toxic (Dovey et al., 2008). Toddlers will therefore naturally reject food that tastes bitter, e.g., green vegetables (Dovey et al., 2008). In younger children, Rozin et al. suggest that dislike of a food's sensory characteristics is the strongest driver of food neophobia, followed by potential harm or sickness

*Abbreviations:* BMI, Body Mass Index; FNS, Food Neophobia Scale; FFQ, Food Frequency Questionnaire; CFNS, Children's Food Neophobia Scale.

\* Corresponding author. Department of Public Health, Sport and Nutrition, Faculty of Health and Sport Sciences, University of Agder, PO Box 422, 4604 Kristiansand, Norway.

*E-mail addresses:* [sissel.h.helland@uia.no](mailto:sissel.h.helland@uia.no) (S.H. Helland), [elling.bere@uia.no](mailto:elling.bere@uia.no) (E. Bere), [helga.birgit.bjornara@uia.no](mailto:helga.birgit.bjornara@uia.no) (H.B. Bjørnarå), [nina.c.Overby@uia.no](mailto:nina.c.Overby@uia.no) (N.C. Øverby).

(Raudenbush, 2012). However, in our modern society foods are generally safe to eat, making food neophobia's original protective function less valuable, and its de facto effect a reduction in toddlers' dietary variety (Nicklaus, 2009).

There are individual differences in willingness to taste new foods, and three categories related to willingness have been suggested: Neophobics, average eaters, and neophilics (those who are overtly willing to try novel foods) (Raudenbush, 2012). Classification of individuals according to these categories is not permanent: neophobia can be influenced through repeated exposure to novel foods (Birch & Marlin, 1982; Rozin & Vollmecke, 1986; Skinner, Carruth, Wendy, & Ziegler, 2002). After a few positive exposures, i.e., no negative consequences of eating a novel food, some children learn that the food is safe to eat, and will then be willing to eat it (Pliner & Salvy, 2006; Rozin & Vollmecke, 1986). However, children respond differently to repeated exposure, and some are still reluctant to eat novel food, even after a number of trials (Caton et al., 2014). Sensory education can be successfully used to reduce effects of food neophobia (Dazeley & Houston-Price, 2015; Hoppu, Prinz, Ojansivu, Laaksonen, & Sandell, 2015; Mustonen & Tuorila, 2010; Park & Cho, 2016; Reverdy, Chesnel, Schlich, Köster, & Lange, 2008). Observance of parents', siblings', and peers' acceptance of foods may also reduce food neophobia (Cooke, Haworth, & Wardle, 2007; Pliner & Salvy, 2006). Moreover, parental socioeconomic status and education level are associated with children's food neophobia (Cooke et al., 2004; Dovey et al., 2008), and food neophobia is also a highly heritable trait (Cooke et al., 2007).

Food neophobia has been associated with reduced consumption of fruit, vegetables (Cooke, Wardle, & Gibson, 2003, 2006; Coulthard & Blissett, 2009; Wardle et al., 2003), and meat (Cooke et al., 2003) in children in general; however, there are few studies (Perry et al., 2015) addressing food neophobia in toddlers separately. Also, most studies on food neophobia address fruit and vegetables, while intake of protein-rich foods such as meat and fish remains generally less explored. Two studies from the UK, conducted with 4- and 5-year-olds and 2- to 6-year-olds, showed that highly neophobic children had lower intake of chicken and cheese (Cooke et al., 2006) and of meat and eggs (Cooke et al., 2003). Further, a French longitudinal study reported that high levels of food neophobia in 2-year-olds was significantly associated with lower intake of meat, fish, and eggs as a whole at the age of 3 years (Yuan et al., 2016). To our knowledge, there are few studies addressing the associations between food neophobia and meat, and previous studies include fish grouped with other foods of animal origin. Recently, however, a study of 8- to 16-year-olds in Spain found an association between food neophobia and decreased intake of fish as a separate food group (Maiz & Balluerka, 2016).

Some studies have focused on potential correlations between consumption of snacks/energy-dense foods and food neophobia, yet the definition of "unhealthy" foods, as well as the results of these studies, is highly variable. Recently, a South Australian cross-sectional study among 2-year-olds reported a positive association between food neophobia and intake of energy-dense and nutrient-poor foods (Perry et al., 2015). This finding seems to contrast with the findings of the two previously cited studies from the UK, in which no associations between food neophobia and intake of sweet/fatty snack foods was reported (Cooke et al., 2003, 2006). In the current obesogenic food environment (World Health Organization, 2016), there is a need for further exploration of possible relations between food neophobia and snacks/energy-dense foods.

To the best of our knowledge, no studies in any Nordic countries have evaluated food neophobia in relation to frequency of food intake in toddlers specifically. The Norwegian national dietary surveys, targeting children aged 24 months, showed that 26% of

parents reported that their child had food or eating problems. The following issues were reported: Poor appetite (13%), liking few foods (10%), allergy/intolerance (5%), and difficulty adapting to the family diet (3%). The report also points out that 27% of the parents withheld certain foods from their child for fear of allergies (Kristiansen, Andersen, & Lande, 2009), a practice that might limit food variety. Considering these results, the objective of the present cross-sectional study was to examine the association between food neophobia and its relation with food intake in a Norwegian sample of toddlers and thereby to replicate previous findings in a more homogeneous sample of children. We hypothesized that, even after controlling for relevant covariates, food neophobia would be negatively associated with intake of fish, meat, berries, fruit, and vegetables, and positively associated with intake of sweet and salty snacks.

## 2. Method

### 2.1. Study design

Data for the present study were derived from the project Preschoolers' Food Courage, which in 2014 collected cross-sectional data in collaboration with the project Healthy and Sustainable Lifestyle (HSL) The HSL represents a combined approach addressing the interrelations between diet, physical activity, health and the environment (Bjørnarå, 2016). The questionnaire was twofold: the first part dealt with parental lifestyle behaviors, while the second assessed toddlers' food and eating behaviors. In total, 351 kindergartens were asked to participate, of which 309 enrolled, rendering a participation rate of 88%. The director of each kindergarten provided consent on behalf of the kindergarten, through a web page. The directors of the participating kindergartens distributed a short invitation letter in both hard copy and e-mail to eligible parents. Either parent of the toddler could take part. More detailed information about the study was obtainable from the study's web page, and parents provided consent electronically prior to distribution of the questionnaire by e-mail. The questionnaire was pilot-tested in seven subjects from a corresponding population of parents of toddlers. The study was conducted in accordance with the Helsinki declaration. The protocol for the present study was approved by the NSD - Norwegian Centre for Research Data, 26/03/2014, reference 37,459. Informed consent was obtained from parents of all participating toddlers and from all participating kindergartens.

### 2.2. Study sample

Participants were recruited from all public and private kindergartens in the counties of Vest-Agder and Aust-Agder that met the inclusion criteria ( $n = 351$ ): having toddlers of the appropriate age (i.e., born in 2012), whose parents could read and understand Norwegian. "Open kindergartens" (where children and their parents attend together) offering part-time enrollment were excluded. Inclusion criteria for the children were as follows: (i) born in 2012, (ii) attended one of the included kindergartens in Vest-Agder or Aust-Agder and (iii) one parent capable of reading and understanding Norwegian. About 3100 parents and toddlers met these inclusion criteria; of these, 605 enrolled. Of the eligible families, 533 parents (17%) filled in the electronic questionnaire. In the two pairs of twins who were enrolled, separate questionnaires were completed for each toddler. Thirty cases were excluded from the study because of missing background data on the toddler, leaving 505 toddlers for inclusion in the final data analysis. Of the 30 excluded cases, 24 had only responded to the adult section of the form, while 6 had incomplete responses on the Children's Food Neophobia Scale (CFNS) or on background data.

Download English Version:

<https://daneshyari.com/en/article/5044301>

Download Persian Version:

<https://daneshyari.com/article/5044301>

[Daneshyari.com](https://daneshyari.com)