and atopic asthma in the offspring. This was found to be independent of sugar intake in early childhood.

REVIEWER COMMENTS. Authors of previous studies have focused on antioxidants in the development of asthma in offspring. Sugar intake has increased by 25% in the United States since 1970. Results from cross-sectional studies have been used to report positive associations between childhood consumption of sugar-containing drinks and asthma. This study reveals that maternal factors may also influence the development of atopy and atopic asthma. Furthermore, the authors speculated that high maternal fructose could contribute to the mechanisms of atopy.

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Effect of an Intervention to Promote Breastfeeding on Asthma, Lung Function, and Atopic Eczema at Age 16 Years, Follow-up of the PROBIT Randomized Trial

Flohr C, Henderson AJ, Kramer MS, et al. *JAMA Pediatr*. 2018;172(1):e174064

PURPOSE OF THE STUDY. In this study, the authors investigated whether an intervention to promote prolonged, exclusive breastfeeding could protect against asthma, atopic dermatitis, and low lung function in adolescence.

STUDY POPULATION. There were 17 046 infant-mother pairs across 31 Belarusian hospitals enrolled in the study. Mothers had to initiate breastfeeding on admission to the postpartum ward and could not have illnesses contraindicating breastfeeding or severely compromising its success; infants had to be singletons of at least 37 completed weeks' gestation and 2500 g in birth weight and have an Apgar score of at least 5 at 5 minutes.

METHODS. This was a cluster randomized trial with a control group of usual care and an intervention group designed to promote prolonged, exclusive breastfeeding. This was the fourth follow-up to the original Promotion of Breastfeeding Intervention Trial in which children at 16 years of age were investigated through physician-conducted skin examinations and spirometry-based lung function (primary outcomes) as well as self-reported asthma and eczema symptoms (secondary outcomes).

RESULTS. On the basis of an examination of 13 557 adolescents (51.5% boys; median age of 16.1 years), 21 (0.3%) children in the intervention group and 43 (0.7%) children in the control group had flexural eczema (−0.4% difference; 95% confidence interval: −0.60% to −0.16%). There was no evidence of a protective effect on self-reported atopic eczema symptoms or asthma outcomes; there was a negative association between intervention and spirometry in a modified intention-to-treat analysis, but this lost significance in subsequent analyses.

CONCLUSIONS. An intervention to promote prolonged, exclusive breastfeeding reduced the risk of flexural atopic dermatitis but had no effect on self-reported atopic eczema symptoms, lung function, or other measures of asthma.

REVIEWER COMMENTS. Although breastfeeding certainly has many benefits, the extent of the benefit with regard to atopy has been uncertain. This study reveals an effect on flexural atopic dermatitis but not on asthma. It is unclear, however, how significant the difference is (ie, whether the eczema that was present was mild and easily controlled). Although there are certainly still many reasons to breastfeed, for many mothers, this is not always possible (eg, medical conditions, underproduction, or logistical issues), and one could extrapolate from this study that prolonged, exclusive breastfeeding is not necessarily protective against all atopy, which may further play a significant role in counseling on breastfeeding as it relates to food introduction and the risk of developing a food allergy.

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Prospective Cohort Study of Breastfeeding and the Risk of Childhood Asthma

Lossius AK, Magnus MC, Lunde J, Størdal K. *J Pediatr*. 2018;195:182–189.e2

PURPOSE OF THE STUDY. To investigate the association between breastfeeding duration and age of complementary food introduction with the development of childhood asthma. Previous studies with similar outcome measures have been mixed without a clear consensus, but large prospective cohort studies are lacking.

STUDY POPULATION. The study included patients in the Norwegian Mother and Child Cohort Study, a prospective population-based pregnancy cohort directed by the Norwegian Institute of Public Health.

METHODS. Between 1999 and 2008, 41 020 mother-child pairs were enrolled for the primary outcome of asthma at the age of 7 years. Two baseline questionnaires were conducted at ~18 weeks' gestation followed by 4 additional questionnaires through the child's first 7 years of life. Asthma diagnosis was defined as ≥2 asthma medications dispensed with at least 1 within 12 months of the child turning 7 years of age. Prescription information was obtained from the Norwegian Prescription Database.

RESULTS. In the primary analysis, 4.8% of the children had asthma at the age of 7 years on the basis of asthma medications dispensed. After confounders were accounted for, there was no difference in adjusted relative risk between asthma and breastfeeding duration (0 to <6 months, 6 to 12 months, or ≥12 months). In addition, no significant association was found between the introduction of complementary food and asthma at 7 years of age. In a secondary analysis, a significantly increased risk of early transient asthma was noted at 3 years of age in those who were breastfed for <6 months compared with ≥12 months (adjusted relative risk: 1.46 [95% confidence interval: 1.15–1.84]). In a subgroup analysis, children with parents without atopic disease were at an increased risk of asthma at 7 years old if they were breastfed for <6 months (P = .043).

CONCLUSIONS. In this large prospective study, no association was found between breastfeeding duration or the timing of complementary food introduction with asthma at the age of 7 years. There appears to be a higher risk of transient early asthma in those who were breastfed for <6 months, which is consistent with results in previous studies.

REVIEWER COMMENTS. In this study, it is suggested that there is an association of longer breastfeeding duration with a lower risk of early wheezing that does not seem to extend into later childhood. Although previous cross-sectional and case-control studies have been highly variable, the conclusions drawn from this investigation are consistent with those of similar large cohort studies. In addition, children without a family history of atopic disease may be at an increased risk of persistent asthma with shorter breastfeeding duration. Additional studies are needed to further clarify this association. This study was limited by selection bias because the participants were of higher socioeconomic status and had lower rates of smoking than the general population.

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Infant Feeding Patterns and Eczema in Children in the First 6 Years of Life

Soto-Ramírez N, Kar S, Zhang H, Karmaus W. *Clin Exp Allergy*. 2017;47(10):1285–1298

PURPOSE OF THE STUDY. To determine if different infant feeding patterns in the first 6 months of life increase the risk of eczema and/or skin allergy in children in the first 6 years of life.

STUDY POPULATION. The sample population was originally derived from a national consumer opinion panel consisting of 500 000 households from throughout the United States from May 2005 to June 2007. Inclusion criteria included women ≥18 years of age in their third trimester of pregnancy, proficiency in English, a stable address for at least 11 months, a healthy mother and infant at birth, term or near-term birth (>35 weeks' gestation), singleton birth, an infant weighing at least 5 lb and not in the ICU for >3 days. Exclusion criteria included serious long-term health problems that would affect feeding. Original questionnaires obtained in the Infant Feeding Practices Study II had a sample size of 2907 mother-infant dyads at birth and 1782 at month 12. In 2012, the mothers were recontacted about their child's well-being at age 6 years. The final sample consisted of 1387 woman-child dyads who provided information on feeding practices in the first 6 months of life and participated in the 6-year follow-up survey.

METHODS. Data were extracted from the Infant Feeding Practices Study II in the United States and its 6-year follow-up. Questionnaires were completed prenatally, near birth, at 1 month, every other month from 2 to 7 months, and then every 7 weeks until age 12 months. Data that were collected included age at onset of eczema, maternal race, family history of eczema, maternal age during pregnancy, parity, maternal prepregnancy BMI, maternal education, marital status, maternal employment, poverty index, household smoking status, sex of infant, birth weight, mode of delivery, and season of delivery. Six different feeding patterns were identified: (1) direct breastfeeding for 1 month; (2) direct breastfeeding for 3 months; (3) direct breastfeeding and pump feeding for the first 3 months; (4) direct breastfeeding, pump feeding, and formula feeding in the first few months; (5) formula feeding for the first 2 to 3 months followed by additional solid food; and (6) formula feeding and solid food since age 1 month. Log-linear models were used to estimate prevalence ratios (PRs) of feeding patterns for infants after doctors diagnosed eczema and/or skin allergy in the first 6 years of life, adjusting for cofounders. Current eczema and/or skin allergy at year 6 of follow-up was used to characterize the disease.

RESULTS. Children who received a combination of direct breast milk, pumped breast milk, and formula (pattern 4) had a statistically significant higher PR for eczema and/or skin allergy than children who were directly breastfed for the first 3 months of life (PR: 1.46; 95% confidence interval: 1.01–2.11) in the 6-year evaluation studies. Direct breastfeeding and pump feeding for the first 3 months (pattern 3) also revealed an increased PR; however, it was not statistically significant (PR: 1.26; 95% confidence interval: 0.85–1.89). Formula feeding introduced at birth had no higher risk for the development of eczema.