

The protective effect of farm milk consumption on childhood asthma and atopy

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Background: Several epidemiological studies found consumption of farm milk to be inversely associated with the occurrence of hay fever, pollen sensitization, and asthma. The information on the specific components of milk conferring protection is limited to studies without analytical measurements of milk. GABRIELA, a large cross-sectional multi-centre study, offered the opportunity to relate analytically measured milk components to asthma and atopy outcomes in children and possibly explain the previously reported protective farm milk effect.

Method: In four rural regions of Germany, Austria, and Switzerland, farm and milk exposure of 7606 5–13 year old children was assessed by a detailed questionnaire and they also provided blood samples to determine specific IgE levels. Viable bacterial counts, whey protein levels, and total fat content were analysed in 800 milk samples that were collected at the participant's homes. Associations of milk consumption and asthma, atopy, hay fever, and atopic dermatitis were computed by stratified weighted logistic regression analyses adjusted for potential confounders.

Result: Farm children as compared to non-farm children had a lower prevalence of asthma (14.0% versus 21.1%), atopy (24.7% versus 40.8%), hay fever (6.2% versus 16.3%), and atopic dermatitis (12.9% versus 17.8%). Raw milk consumption, that was reported in questionnaires, was inversely associated with asthma (aOR: 0.59, 95%-CI: 0.46–0.74), atopy (0.74, 0.61–0.90), and hay fever (0.51, 0.37–0.69) independent of other farm exposures. Consumption of exclusively boiled farm milk did not show a protective effect. The heating status of consumed milk as reported by parents was in very good agreement with objective measurements. Total viable bacterial counts or total fat content of milk were not significantly related to asthma or atopy. Yet, increased levels of the whey proteins were inversely associated with asthma but not with atopy. Significant inverse dose-response relations were observed for lactoferrin (P-value for linear trend = 0.02), TGF- β 2 (0.02), α -lactalbumin (0.02), and β -lactoglobulin (0.04).

Conclusion: The protective effect of raw milk consumption on asthma seems to be associated with the whey protein fraction of unprocessed farm milk. Relevant immunomodulatory compounds of farm milk and underlying mechanisms need to be explored in more detail.