

| Authors (Study name) | Published | Study population | Study type | N | Countries | Exposure | Main results- (adj OR & 95% CI) | Reference | Authors, title |
|---------------------------------|-----------|--|-----------------|-------|--------------------|---|--|--|---|
| Riedler et al. (ALEX) | 2001 | Rural farm & non-farm children 6-12 years | Cross-sectional | 812 | AU, DE, CH | Milk on farm/farm gate | Consumption of farm milk during first year of life inversely associated with asthma, hay fever, and atopy, independent of other farm exposure | Lancet 2001;358:1129-33. | Waser M, Maisch S, et al. Exposure to farming in early life and development of asthma and allergy: a cross-sectional survey. |
| Waser et al. (PARSIFAL) | 2007 | Rural farm, non-farm and peri-urban children 5-13 years | Cross-sectional | 14893 | AU, DE, CH, NL, SE | Milk on farm/farm gate | farm milk consumption ever in life and asthma: OR 0.47 (0.61–0.88), rhinoconjunctivitis: OR 0.56 (0.43–0.73), sensitization to pollen: OR 0.67 (0.47–0.96), and food mix: OR 0.42 (0.19–0.92). Association observed in all subgroups, independent of farm-related co-exposures | Clin Exp Allergy 2007;37:661-70. | Waser M, Michels KB, Bieli C, Floistrup H, Pershagen G, von Mutius E, et al. Inverse association of farm milk consumption with asthma and allergy in rural and suburban populations across Europe. |
| Perkin & Strachan | 2006 | rural farm and non-farm children | Cross-sectional | 4767 | UK | Unpasteurized milk | raw milk - less eczema OR 0.59 (0.40-0.87), less atopy OR 0.42 (0.10 - 0.53), higher stimulated production IFN- γ , effect independent of farming status. No effect on asthma | J Allergy Clin Immunol 2006;117:1374-81. | "Which aspects of the farming lifestyle explain the inverse association with childhood allergy." |
| Barnes et al. | 2001 | rural farm and non-farm and urban children (11-19 years) | Cross-sectional | 929 | GR | Unpasteurized milk products | Atopy and unpasteurized milk with & without farm animal contact 0.32 (0.13–0.78) and 0.58 (0.34–0.98), respectively | Clin. Exp. Allergy. 2001;31:1822–1828. | Crete: Does farming explain urban and rural differences in atopy?. |
| Radon et al. | 2004 | rural farm and non-farm adults (18-44 years) | Cross-sectional | 321 | DE | raw, unboiled milk | Raw milk and atopy OR 0.65 (0.36–1.18), for those with early farm animal contact 0.35 (0.17–0.74) | Clin. Exp Allergy 2004;34:1178–83. | Radon K, Windstetter D, Eckart J, Dressel H, Leitritz L, Reichert J, et al. Farming exposure in childhood, exposure to markers of infections and the development of atopy in rural subjects. Clin |
| Wickens et al. | 2002 | farm and small town children (7-10 years) | Cross-sectional | 293 | NZ | unpasteurized milk (ever), yogurt weekly | Early yogurt consumption and hay fever OR 0.30 (0.1–0.7); any unpasteurized milk and atopic eczema: OR 0.2 (0.1–0.8). No association between unpasteurized milk consumption and asthma or atopy | | |
| Remens et al. | 2003 | rural farm and non-farm children (6-15 years) | Cross-sectional | 710 | FI | farm milk in infancy | No significant association with atopy | | |
| Ege et al. (PASTURE) | 2008 | farm and non-farm children followed since pregnancy | Cohort | 922 | FI, FR, AU, DE, CH | maternal consumption of raw and boiled farm milk during pregnancy | Boiled farm milk associated with with specific IgE to cow's milk: adj. OR and (95% CI): 1.78 (1.08–2.93) | | |
| Pfefferle et al. (PASTURE) | 2010 | farm and non-farm children followed since pregnancy | Cohort | 922 | FI, FR, AU, DE, CH | Skimmed and unskimmed farm milk, farm produced butter and yogurt during pregnancy | Maternal consumption of farm produced butter during pregnancy associated with increased IFN- γ and TNF- α production in cord blood, farm produced yogurt inversely associated with these cytokines | | |
| Loss et al. (GABRIELA) | 2011 | school-aged children | Cross-sectional | 8334 | DE, AU, CH | raw milk consumption and milk constituents | raw milk & asthma OR 0.59 (0.46-0.74), atopy OR, 0.74 (0.61-0.90), and hay fever OR 0.51 (0.37-0.69) independent of other farm, The findings suggest that the protective effect of raw milk consumption on asthma might be associated with the whey protein fraction of milk. | J Allergy Clin Immunol 2011;128:766-73.) | C., Genuneit, J., Pekkanen, J., Roponen, M., Hirvonen, M.R., Dalphin, J.C., Dalphin, M.L., Riedler, J., von, M.E., Weber, J., Kabesch, M., Michel, S., Braun-Fahrlander, C., Lauener, R., 2012. Prenatal and early-life exposures alter expression of innate immunity genes: the PASTURE cohort study. J Allergy Clin Immunol 130, 523-530. |
| Bieli et. Al. (ALEX & PARSIFAL) | 2007 | ALEX and PARSIFAL subset with DNA samples | Cross-sectional | 2054 | SE, NL, AU, DE, CH | Milk on farm/farm gate | genotypes of CD14/-1721. Adj. OR (95%CI) AA: 0.81 (0.07–0.47); AG: 0.47 (0.26–0.86); and GG: 0.98(0.46–2.08). Similar patterns for symptoms of hay fever and pollen sensitization. | Allergy Clin Immunol 2007;120:1308-15. | W, Waser M, et al. A polymorphism in CD14 modifies the effect of farm milk consumption on allergic diseases and CD14 gene expression. J Allergy Clin Immunol 2007;120:1308-15. |
| Alfven et al. (PARSIFAL) | 2006 | Rural farm, non-farm and peri-urban children 5-13 years | Cross-sectional | 14893 | AU, DE, CH, NL, SE | farm lifestyle | Growing up on a farm was found to have a protective effect against all outcomes studied, both self-reported, such as rhinoconjunctivitis, wheezing, atopic eczema and asthma and sensitization (allergen specific IgE \geq 0.35 kU/l). The adjusted odds ratio (OR) for current rhinoconjunctivitis symptoms was 0.50 (95% confidence interval (CI) 0.38–0.65) and for atopic sensitization 0.53 (95% CI 0.42–0.67) for the farm children compared to their references. The prevalence of allergic symptoms and sensitization was also lower among Steiner school children compared to reference children, but the | Allergy 2006; 61, 414-421. | Alfven, T., Braun-Fahrlander, C., Brunekreef, B., von, M.E., Riedler, J., Scheynius, A., van, H.M., Wickman, M., Benz, M.R., Budde, J., Michels, K.B., Schram, D., Ublagger, E., Waser, M., Pershagen, G., 2006. Allergic diseases and atopic sensitization in children related to farming and anthroposophic lifestyle--the PARSIFAL study. |

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| Perkin MR. | 2007 | | | | | | commentary on Wasset et al. 2007 | Clin Exp Allergy 2007;37: 627-30 | Perkin MR. Unpasteurized milk: health or hazard? Clin Exp Allergy 2007;37: 627-30 |
| Loss, G et al. (PASTURE) | 2015 | farm and non-farm children followed since pregnancy | Cohort | 922 | FI, FR, AU, DE, CH | raw milk, UHT milk, pasteurized milk | When contrasted with ultra-heat treated milk, raw milk consumption was inversely associated with occurrence of rhinitis (adjusted odds ratio from longitudinal models [95% CI]: 0.71 [0.54-0.94]), respiratory tract infections (0.77 [0.59-0.99]), otitis (0.14 [0.05-0.42]), and fever (0.69 [0.47-1.01]). Boiled farm milk showed similar but weaker associations. Industrially processed pasteurized milk was inversely associated with fever. Raw farm milk consumption was inversely associated with C-reactive protein levels at 12 months (geometric means ratio [95% CI]: 0.66 [0.45-0.98]). | J Allergy Clin Immunol 2015: 135, p 56-62 | Consumption of unprocessed cow's milk protects infants from common respiratory infections. |
| Loss, G et al. | 2012 | | | | | | | J Allergy Clin Immunol 2012: 130, 523-530. | Loss, G., Bitter, S., Wohlgensinger, J., Frei, R., Roduit, C., Genuneit, J., Pekkanen, J., Roponen, M., Hirvonen, M.R., Dalphin, J.C., Dalphin, M.L., Riedler, J., von, M.E., Weber, J., Kabesch, M., Michel, S., Braun-Fahrlander, C., Lauener, R., 2012. Prenatal and early-life exposures alter expression of innate immunity genes: the PASTURE cohort study. J Allergy Clin Immunol 130, 523-530. |
| Tremonte et al. | 2014 | | | | | | | | Raw milk from vending machines: Effects of boiling, microwave treatment, and refrigeration on microbiological quality |