



Thermal processing and allergenic potential of egg for children

Chantal Brossard, Marie-Anne Legoux, Julie Chabauty-Chartier, Fabienne Rancé, Anne Juchet, Martine Drouet, Evelyne Paty, Sandrine Legoué-Morillon, Francoise Nau, Olivier Tranquet, et al.

► To cite this version:

Chantal Brossard, Marie-Anne Legoux, Julie Chabauty-Chartier, Fabienne Rancé, Anne Juchet, et al.. Thermal processing and allergenic potential of egg for children. Food Allergy and Anaphylaxis Meeting (FAAM), The European Academy of Allergy and Clinical Immunology (EAACI). Zurich, CHE., Oct 2014, Dublin, Ireland. pp.1. hal-01209775

HAL Id: hal-01209775

<https://hal.science/hal-01209775>

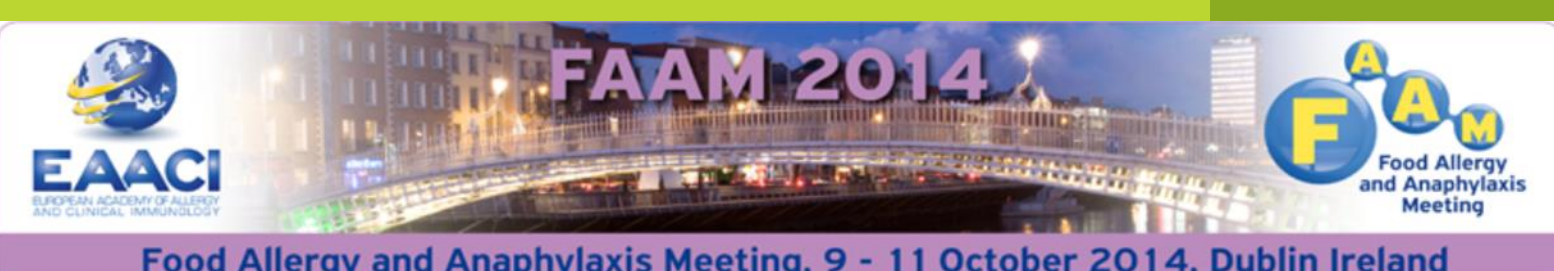
Submitted on 5 Jun 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

THERMAL PROCESSING AND ALLERGENIC POTENTIAL OF EGG FOR CHILDREN

C. BROSSARD¹, M.A. LEGOUX¹, J. CHABAUTY¹, F. RANCÉ², A. JUCHET², M. DROUET³, E. PATY⁴, S. LEGOUÉ-MORILLON⁵, F. NAU⁶, O. TRANQUET¹, S. DENERY¹

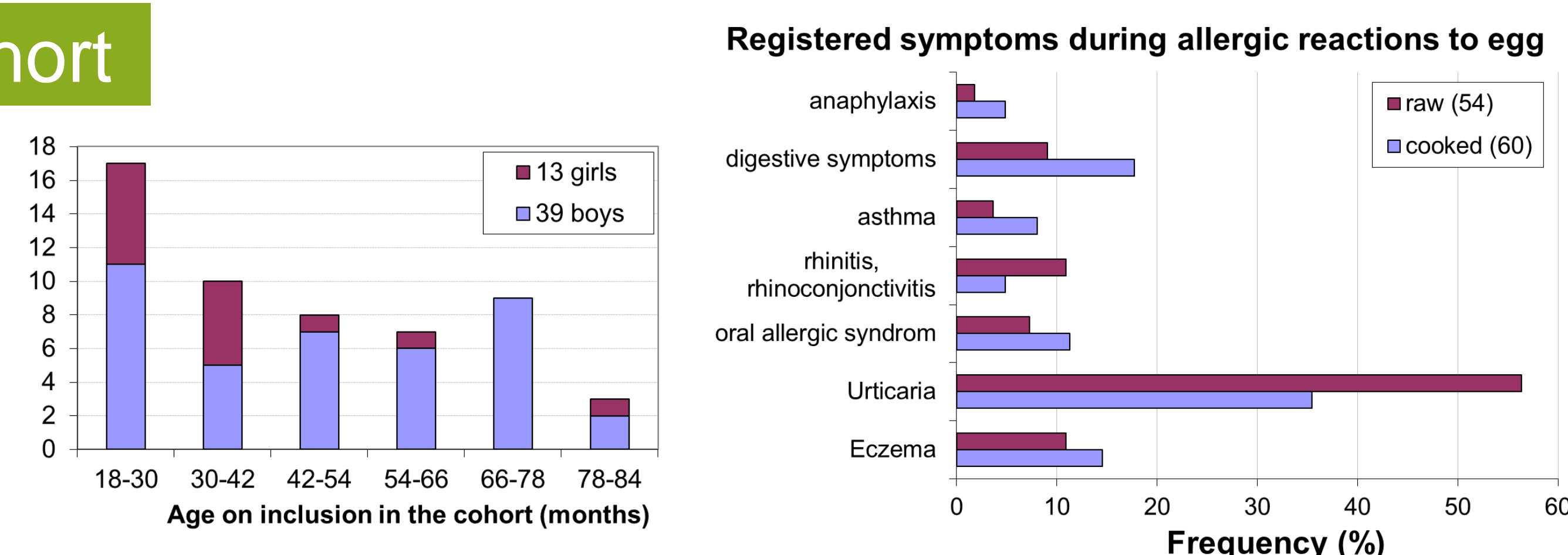


FOOD ALLERGY TO EGG IN VERY FREQUENT IN CHILDHOOD AND IT IS KNOWN THAT SOME ALLERGIC CHILDREN CAN TOLERATE COOKED EGG. THIS WORK AIMS TO ANALYZE HOW PASTEURIZATION AND HARD-BOILING OF EGG AND ITS FRACTIONS IMPACT *IN VIVO* REACTIVITY EVALUATED BY PRICK-TESTING IN A COHORT OF CHILDREN ALLERGIC TO EGG AND ITS RELATION TO IgE-BINDING PROFILES TO EGG PROTEINS OR FRACTIONS

Recruitment and characterization of the children cohort

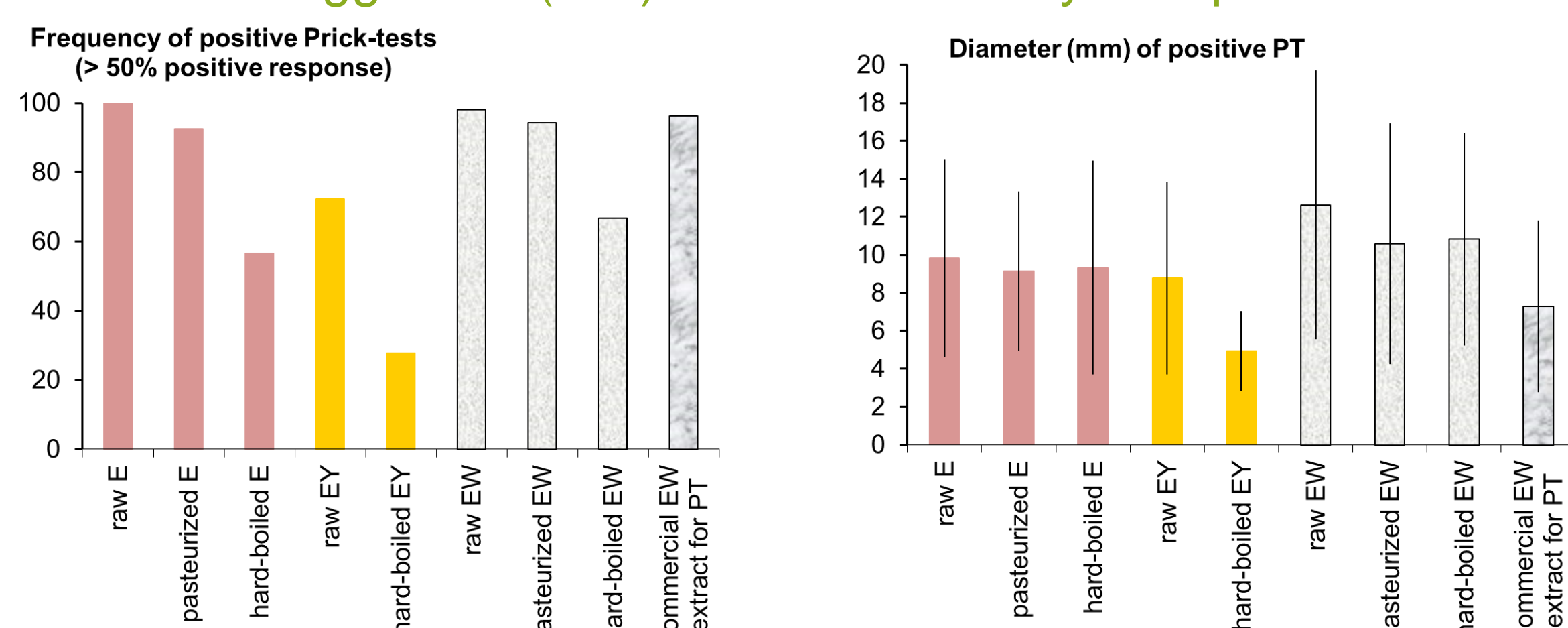
Allergologists from 4 medical units recruited with inform consent 52 children allergic to egg (18 months-7 years old). Upon inclusion, they gathered clinical data, performed PT with specially prepared egg fractions and took sera.

Youngest children (18-30 months) and boys were the most frequent. Urticaria largely dominates among registered symptoms upon allergic reaction both with raw and cooked egg offending foods. These characteristics agree with knowledge on food allergy to egg and previous children cohort allergic to egg.



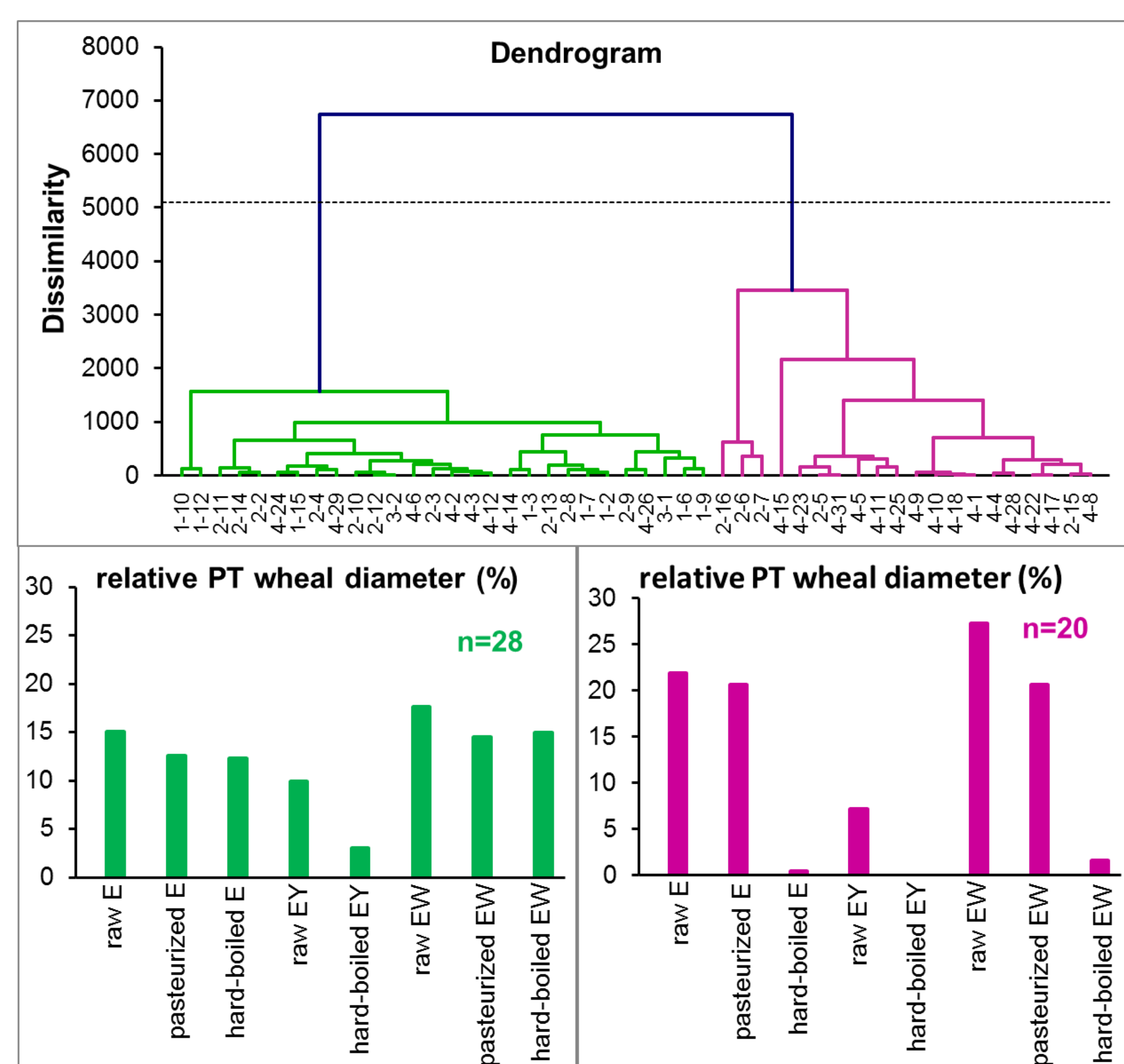
Reactivity to raw and processed egg fractions

Reactivity to raw, pasteurized and hard-boiled egg (E), egg yolk (EY) and egg white (EW) was evaluated by skin prick-test



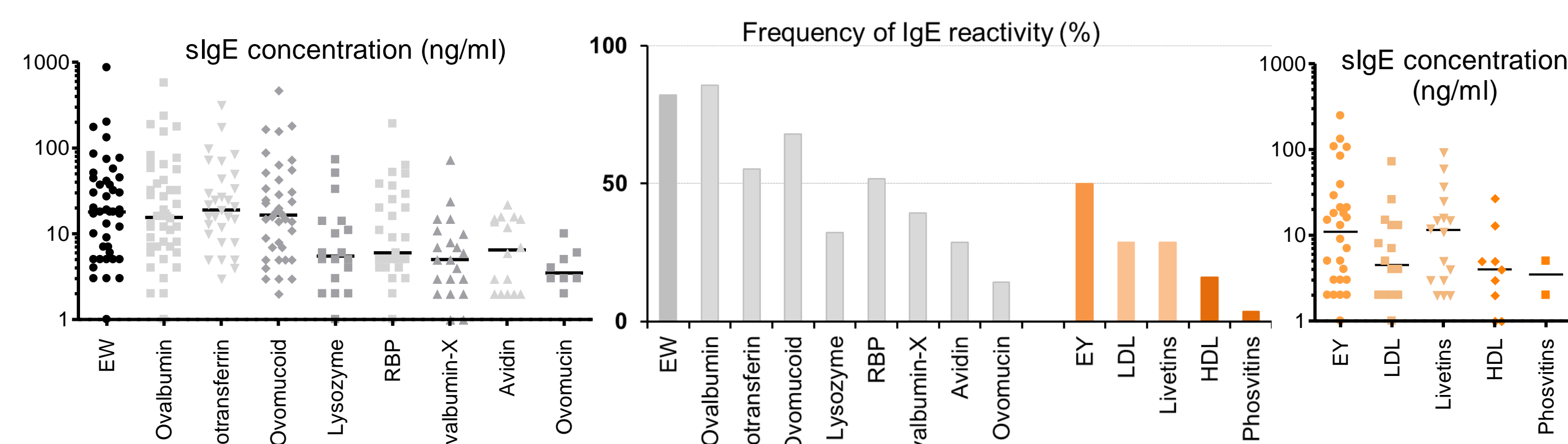
All children had positive skin prick-tests (SPT) to raw E and EW and 72% to raw EY; mean diameter was larger for EW. Pasteurization had limited impact on PT reactivity to E and EW. Hard-boiling reduced both frequency of positive PT and mean positive diameter for EY but only frequency of positive PT for E and EW.

Hierarchical Ascending Classification (HAC) analysis of relative PT diameters by child (n= 48) evidenced two typical behaviors



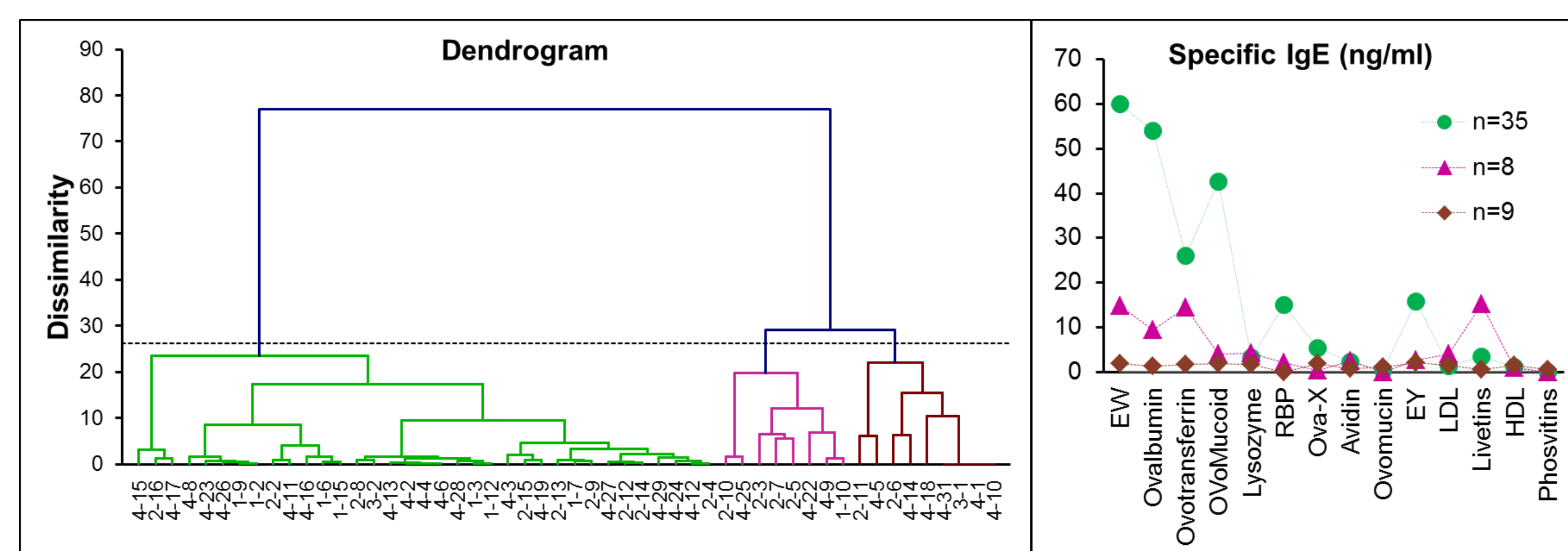
IgE reactivity to egg proteins and fractions

Sera samples were analyzed by ELISA for IgE-reactivity against EW and 4 known allergens + 4 proteins of EW EY and 4 sub-fractions of EY



Large differences in IgE sensitization towards both EW and EY were evidenced. In EW, ovalbumin (Gal d 2), ovomucoid (Gal d 1), ovotransferrin (Gal d 3) and riboflavin-binding protein (RBP) were IgE-reactive for more than 50% sera. In EY, plasma sub-fractions (LDL and livetins) were more IgE reactive than granules sub-fractions (HDL and phosvitins).

HAC analysis of IgE profiles by child (n=52) evidenced three typical profiles



Links between PT reactivity and IgE profiles (n=48)

Children with no impact of thermal process on PT reactivity except hard-boiling of EY significantly tended to be mainly sensitized to ovalbumin and ovomucoid,

Children with a clear decrease of PT reactivity upon hard-boiling for the both E, EY and EW significantly presented a flat IgE profile or a mild sensitization. They are mainly sensitized to ovalbumin and ovotransferrin in EW and livetins in EY.

Contingency table		Relative PT reactivity	
$\chi^2=0,017$		1	2
IgE profile	1	22	9
	2-3	6	11

CONCLUSIONS - KEY POINTS

- TWO PT-REACTIVITY PROFILES VERSUS THERMAL PROCESSES OF EGG ARE CLEARLY EVIDENCED AND RELATED TO IgE SENSITIZATION**
- PASTEURIZATION OF EGG OR EGG WHITE SHOWED VERY LOW IMPACT ON *IN VIVO* REACTIVITY EVALUATED BY PRICK-TESTING**
- HOW PT-REACTIVITY AND IgE PROFILES CHANGE WITH TOLERANCE OF EGG IS CURRENTLY INVESTIGATED**

Acknowledgement: OVONUTRIAL was carried out within the framework of Programme National de la Recherche and financially supported by the Agence Nationale de la Recherche.

