

Egg White and Milk Allergens

Prevalence of sensitization to specific food allergens varies depending on age and various environmental factors. It is currently estimated, that prevalence of milk allergy in infants is 2 – 2.5% and egg hypersensitivity around 1 – 2%. Most children “outgrow” cow’s milk allergy by the third year of life, but 10 – 25% retain the sensitivity. Egg allergic children are also likely to develop tolerance by late childhood (3 – 5 years old) (Cianferoni and Spergel 2009). *Gallus gallus domesticus* (chicken) and *Bos domesticus* (cow) are the most common animals kept for food consumption worldwide.

Of the individuals suffering from food allergy, 31% of the children and 8% of the adults are allergic to egg (Frémont *et al.* 1997). Ovomucoid, Gal d 1, represents approx. 11% of the egg white protein content. This heat-stable trypsin inhibitor (Besler *et al.* 1999) is the immunodominant protein fraction in egg white, even though ovalbumin, Gal d 2, with approx. 54% is the most abundant egg white protein. Ovalbumin has been used most extensively in research as model allergen (Bernhisel-Broadbent *et al.* 1994). This heat-labile phosphoglycoprotein is an inactive member of the serine protease inhibitor superfamily (serpins) (Huber and Carrell 1989) and can be an additive in a number of vaccines. Ovotransferrin, Gal d 3, also known as conalbumin (12 – 13% of egg white), has a strong iron-binding capability and thus can be used as an antioxidant, antimicrobial or iron-supplementing agent, in food and particularly infant food (Tong *et al.* 2013).

Cow milk has a protein content of 3 – 3.5%, including caseins and whey proteins. Casein (Bos d 8) is heat- and digestion-stable and found in milk, cheese and dairy products. 63% of milk-allergic children show IgE binding to Bos d 8 in enzyme immunoassay (Bernard *et al.* 1998). Over 90% of the milk allergic patients show presence of Bos d 5 (β -lactoglobulin) specific IgE antibodies (Gjesing *et al.* 1986). Bovine serum albumin (Bos d 6) occurs as a minor allergen in cow’s milk

(Werfel *et al.* 1997). Its main role is the transport, metabolism and distribution of ligands and the protection from free radicals (Farrell *et al.* 2004). More than 90% of cow milk allergic patients show IgE binding to this allergen (Gjesing *et al.* 1986). β -Lactoglobulin is resistant to acid hydrolysis, heat-labile and known as one of the best characterized lipid-binding proteins (del Val *et al.* 1999). Lactoferrin (Bos d Lactoferrin) is, like Bos d 5 and 6, present in the whey fraction of milk and can be found in most species at levels below 1% (Schanbacher *et al.* 1993). Nevertheless, it is a major allergen of milk. This iron-binding glycoprotein of the transferrin family has antimicrobial activity and is therefore used as disinfectant substance in food industry (Taylor *et al.* 2004). Most milk-allergic patients are sensitized to several proteins with great variability regarding IgE response (Ward *et al.* 2002).

DIARECT’s non recombinant allergens are purified from either hen egg or cow milk.

Ordering Information		NEW!
53700	Bos d 5 (β -Lactoglobulin;	0.1 mg
53701	non recombinant)	1.0 mg
53800	Bos d 6 (Serum albumin;	0.1 mg
53801	non recombinant)	1.0 mg
53900	Bos d 8 (Casein;	0.1 mg
53901	non recombinant)	1.0 mg
54000	Bos d Lactoferrin;	0.1 mg
54001	(non recombinant)	1.0 mg
53200	Gal d 1 (Ovomucoid;	0.1 mg
53201	non recombinant)	1.0 mg
53300	Gal d 2 (Ovalbumin;	0.1 mg
53301	non recombinant)	1.0 mg
53400	Gal d 3 (Conalbumin;	0.1 mg
53401	non recombinant)	1.0 mg

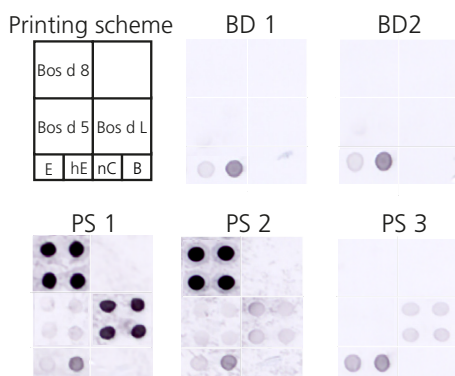


Figure: Immunodot analysis of blood donors (BD 1 – 2) and allergy samples (PS 1 – 3) for IgE antibodies against individual purified milk allergens. Bos d 8, Bos d 5 and Bos d Lactoferrin were printed in quadruplicates on nitrocellulose membrane. Anti-IgE antibody (E) and human IgE (hE) were printed as positive controls, HSA (nC) and Buffer (B) as negative controls.

References:

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In some countries the use of certain antigens in diagnostic tests may be protected by patents. DIARECT is not responsible for the determination of these issues and suggests clarification prior to use.

180726_Rev02

