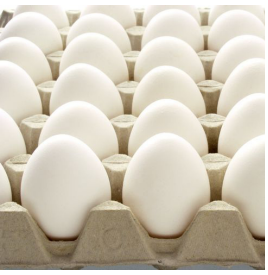

AUSTRALIAN EGG CORPORATION LIMITED

# AECL Research Update October 2012

RESEARCH UPDATE

## COOKING METHODS CHANGE THE ALLERGENICITY OF EGGS

*Source: Liu X, Feng BS, Kong X, Xu H, Li X et al. Food-Cooking Processes Modulate Allergenic Properties of Hen's Egg White Proteins. Int Arch Allergy Immunol. 2012 Sep 25;160(2):134-142. [Epub ahead of print]*

This Chinese study investigated whether the way eggs were cooked could reduce their allergenicity. Eggs were prepared by traditional Chinese cooking, including steaming, water boiling, frying, spicing and tea boiling. The allergenicity of the egg was tested using a range of techniques. The researchers found protein degradation was significant following tea boiling and spiced-tea boiling. The total allergenic potential of water-boiled egg and fried egg was relatively higher than that of steamed egg, spiced egg and tea-boiled egg. When challenges were conducted in an animal model, the steamed egg, spiced egg and tea-boiled egg induced a weaker immune response compared to raw egg, water-boiled egg and fried egg. This study suggests eggs prepared by steaming, spicing, or tea boiling can weaken the allergenicity of egg proteins.

**KEY FINDING: The method used to cook eggs can reduce the allergenicity of the egg proteins.**

**APPLICATION: While the cooking methods used in this study may not be widely applicable to Australia it is interesting to note that the cooking method may impact on the allergenicity of eggs.**

**[Suitable for eDM]**

**Level of evidence: in-vitro and animal model**

## BUILDING TOLERANCE TO EGG ALLERGY IN CHILDREN

*Source: Dello Iacono I, Tripodi S, Calvani M, Panetta V, Verga MC, Miceli Sopo S. Specific oral tolerance induction with raw hen's egg in children with very severe egg allergy: A randomized controlled trial. Pediatr Allergy Immunol. 2012 Sep 9. doi: 10.1111/j.1399-3038.2012.01349.x. [Epub ahead of print]*

This research evaluated the efficacy and safety of a 6 month specific oral tolerance induction protocol in children with very severe hen egg allergy. In the study, 20 children (5-11 years old) were put in either a treatment group or a control group. Those in the treatment group were exposed to a hen egg emulsion and then challenged with egg 6 months after beginning the treatment. The control group were kept on an egg free diet for 6 months and then challenged as well. After 6 months, 9 out of 10 children in the treatment group achieved partial tolerance (tolerated at least 10ml of an egg emulsion but less than 40ml) and one was only able to tolerate 5ml. In the control group, 9 out of 10 tested positive to the egg challenge at less than 0.9ml of raw egg emulsion and one reacted to 1.8ml. All children in the treatment group had side effects but none were severe. These results showed 6 months of specific oral tolerance induction with raw hen egg emulsion led to partial tolerance in a significant percentage of children with severe egg allergy.

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**KEY FINDING: 9 out of 10 children with severe egg allergy achieved partial tolerance to hen eggs after 6 months of specific oral tolerance induction with a hen egg emulsion.**

**APPLICATION: Adds to the growing body of evidence which suggests some exposure to egg in children with egg allergy may help in building tolerance.** **[Suitable for eDM]**
**Levels of Evidence: II**

## WHOLE EGG BETTER THAN EGG SUBSTITUTE FOR METABOLIC SYNDROME

*Source: Blesso CN, Andersen CJ, Barona J, Volek JS, Fernandez ML. Whole egg consumption improves lipoprotein profiles and insulin sensitivity to a greater extent than yolk-free egg substitute in individuals with metabolic syndrome. Metabolism. 2012 Sep 26. pii: S0026-0495(12)00318-6. doi: 10.1016/j.metabol.2012.08.014. [Epub ahead of print]*

This study investigated the impact of feeding 3 eggs per day, as part of a moderately carbohydrate restricted diet (25-30% energy), on cholesterol levels and measures of insulin resistance in men and women with the metabolic syndrome. Participants consumed either 3 eggs per day or the equivalent amount of a yolk-free egg substitute (as part of a carbohydrate restricted diet) for 12 weeks. Over the course of 12 weeks, all individuals improved their lipid profiles including triglyceride levels as well as VLDL cholesterol particle size, large VDL, total LDL, small LDL and medium LDL particles. Furthermore, there were increases in HDL cholesterol, large LDL and large HDL particles for all individuals. However, there were greater increases in HDL cholesterol and large HDL particles in those consuming whole eggs compared to those consuming the egg substitute. Blood insulin and insulin resistance were reduced and both HDL and LDL size increased over time in the whole egg group only. This study suggests incorporating daily whole egg intake in a moderately carbohydrate restricted diet provides further improvements in lipid profile and insulin resistance in adults with the metabolic syndrome.

**KEY FINDING: Consuming 3 eggs per day as part of a carbohydrate restricted diet improved lipid profile and insulin resistance in adults with the metabolic syndrome.**

**APPLICATION: This study suggests rather large intakes of eggs are well tolerated by, and may provide some benefit, to adults with the metabolic syndrome.** **[Suitable for eDM]**
**Levels of Evidence: III-2**

## FOLATE AND RISK OF HEART DISEASE

*Source: Wang Z, Zhou B, Nie Z, Gao W, Wang Y. Folate and risk of coronary heart disease: A meta-analysis of prospective studies. Nutrition, Metabolism & Cardiovascular Diseases 22 (10): 890-899, October 2012.*

This research was an analysis of 14 studies to assess whether there is a relationship between folate and heart disease. In those studies assessing folate intake from diet it was found that there was a significant relationship between the highest intake of folate and a reduced risk of heart disease. Furthermore, an increase in folate intake of 200ug per day was associated with a 12% decrease in the risk of developing heart disease. When looking at blood levels of folate a borderline relationship was found between the highest blood levels of folate and heart disease risk where every 5mmol/l increase in blood folate was associated with an 8% decrease in the risk of developing heart disease. This analysis of the current research suggests that dietary folate and blood folate levels are related to risk of heart disease, whereby high levels reduce risk.

**KEY FINDING: Highest dietary folate and blood levels of folate are associated with a reduced risk of heart disease.**

**APPLICATION: Eggs provide 97ug folate per serve which is 49% RDI for adults.** **[Suitable for eDM]**
**Levels of Evidence: III-2**

## B-VITAMINS AND MENTAL HEALTH IN ADOLESCENCE

*Source: Herbison CE, Hickling S, Allen KL, O'Sullivan TA, Robinson M et al. Low intake of B-vitamins is associated with poor adolescent mental health and behaviour. Prev Med. 2012 Sep 22. pii: S0091-7435(12)00461-6. doi: 10.1016/j.ypmed.2012.09.014. [Epub ahead of print]*

This Australian study investigated the relationship between intake of B vitamins and adolescent mental health and behavior. In the study 2869 seventeen year old adolescents had dietary intakes of B-group vitamins measured via a food frequency questionnaire and a validated mental health and behavior measure was used to assess their mental health. Lower intake of vitamin B1, B2, B3, ,B5, B6 and folate was associated with higher externalizing behavior scores. [Externalizing problems are related to higher risk of offending and substance abuse]. Reduced intake of vitamin B6 and folate was associated with higher internalizing behavior (such as depression and anxiety) scores. This study suggests there may be a link between B vitamins and mental health in adolescents. Further trials are needed to confirm this.

**KEY FINDING: Lower intakes of B1, B2, B3, B5, B6 and folate are related to poorer mental health in 17 year old adolescents.**

**APPLICATION: Eggs are a source of B1, B2, B5 and folate.** **[Suitable for eDM]**
**Levels of Evidence:III-2**

## VITAMIN D AND PREGNANCY OUTCOMES

*Source: Christesen HT, Falkenberg T, Lamont RF, Jørgensen JS. The impact of vitamin D on pregnancy: A systematic review. Acta Obstet Gynecol Scand. 2012 Sep 14. doi: 10.1111/aogs.12000. [Epub ahead of print]*

This research is a systematic review of the evidence on vitamin D and pregnancy outcomes. In intervention trials, larger intakes of vitamin D increased blood levels of vitamin D, increased maternal weight gain and resulted in fewer vitamin D deficiency symptoms. In observational studies lower vitamin D intake or low blood levels of vitamin D were associated with adverse fertility parameters, preeclampsia, gestational diabetes or higher blood glucose, bacterial vaginosis, primary cesarean section, none or a few days' shorter gestation and post partum depression. While not providing concrete evidence, these results suggest vitamin D may have an effect on several pregnancy outcomes.

**KEY FINDING: Vitamin D may affect several pregnancy outcomes.**

**APPLICATION: Adequate vitamin D is required during pregnancy. Eggs can contribute some vitamin D to the diet.** **[Suitable for eDM]**
**Levels of Evidence:I**

## VITAMIN D LEVELS IN PREGNANCY RELATED TO MENTAL DEVELOPMENT IN INFANTS

*Source: Morales E, Guxens M, Llop S, Rodriguez-Bernal CL, Tardon A. Circulating 25-hydroxyvitamin D3 in pregnancy and infant neuropsychological development. Pediatrics 2012; 130: e913-e920.*

This study investigated whether there is a relationship between blood levels of vitamin D in pregnancy and neuropsychological development in infants. In the study, 1820 Spanish mothers had their vitamin D levels tested in pregnancy (average 13.5 weeks gestation). When the infants were approximately 14 months old, trained psychologists assessed their mental and psychomotor scores. A positive relationship was found between blood levels of vitamin D in pregnancy and mental and psychomotor scores in the offspring. It was found that infants of mothers with vitamin D levels in pregnancy higher than 30ng/ml showed higher mental score and higher psychomotor score compared to those of mothers with vitamin D levels less than 20ng/ml.

**KEY FINDING: Higher levels of vitamin D in pregnancy were associated with improved mental and psychomotor development in infants.**

**APPLICATION: Pregnant women need to be encouraged to maintain adequate vitamin D levels during pregnancy. Eggs can contribute some vitamin D to the diet.** **[Suitable for eDM]**

**Levels of Evidence:III-2**

## BREAKFAST IMPROVES COGNITIVE FUNCTION IN CHILDHOOD

*Source: Wesnes KA, Pincock C, Scholey A. Breakfast is associated with enhanced cognitive function in schoolchildren. An internet based study. Appetite 59 (3): 646-649, Dec 2012.*

In this study of 1386 UK school aged children, children logged on to a website before lunch and answered questions about their food and drink consumption on that day and then performed cognitive tests of attention and episodic memory. Results of the tests showed breakfast consumers had superior performance on tests of attention and episodic memory compared to those who had skipped breakfast. This study adds to the body of evidence suggesting breakfast plays a positive role in maintaining cognitive function during the morning.

**KEY FINDING: Breakfast consumers showed superior performance on tests of attention and episodic memory compared to those who had skipped breakfast.**

**APPLICATION: This builds on the body of evidence suggesting breakfast plays an important role in cognitive function.** **[Suitable for eDM]**

**Levels of Evidence:III-2**

For further advice regarding the content of this research update, contact Bronwyn Eisenhauer - Research Dietitian at Food & Nutrition Australia directly on beisenhauer@foodnut.com.au

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