

UA 2/05 Final Report

Project Title: Nutritionally enhanced wheat: Bioavailability of different forms of lutein in bread wheat

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Executive Summary:

Bread Wheat germplasm containing high levels of the natural yellow pigment, lutein, has been developed at the University of Adelaide. This pigment is essential for human eye health, in particular the reduction in the incidence of macula degeneration which a major cause of age related blindness, is a strong antioxidant and is also an important factor in the characteristic yellow colour of Asian alkaline noodles. As a consequence, this germplasm could form the basis for domestic and export market opportunities for a) breads with improved nutritional value and b) alkaline noodles with proved nutritional value and without colour additives thereby allowing savings in production costs. Lutein in wheat grain is present in a number of forms and the results of this project indicate that lutein in the form of esters is more readily bio-available than free lutein. Since the high production of lutein in grain of most wheat cultivars is naturally convert to the more bio-degradable form, lutein esters, during storage, there is no pressing need for genetic manipulation of lutein/luein ester ratios. This research therefore resolves an issue that was limiting further development of high lutein germplasm. Further improvement such as reducing lipozygenase activity to improve the stability of lutein during dough preparation and expand the range og potential end products can now proceed. A better understanding of the relationship between esterification and storage conditions would facilitate broader application in the food industry