

EVALUATION OF BASIC PROPERTIES OF MACADAMIA NUT OIL

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ABSTRACT

Macadamia oil is obtained from the nuts of macadamia trees (*Proteaceae* family). Common names of the trees are, Australian nut and Queensland nut. Species are "smooth shelled macadamia" called *Macadamia integrifolia* and "rough shelled macadamia" called *Macadamia tetraphylla*. *Macadamia ternifolia* is also the name used for *M. integrifolia*. *Macadamia integrifolia* is native to Australian and Hawaii islands. It grows in rain forests and close to streams. *Macadamia tetraphylla* is native to Southeastern Queensland and Northeastern New South Wales. Macadamias are large spreading evergreen trees reaching 30-40 feet height. Macadamia nuts contain oil more than 75 % of their weight, 9.0 % proteins, 9.3 % carbohydrates, 1.5 % moisture, 1.6 % mineral matters and 2.0 % fiber (Rick, 1991). The kernels of macadamia contain vitamin A1, B1, B2, niacin and essential elements such as calcium, iron, phosphorus, magnesium and potassium. The oil is a triglyceride oil and contains primarily monounsaturated fats up to 80-84 %. Macadamia oil contains the highest percentage of monounsaturates when compared to both olive and canola oils (www.macnut.co.). Various basic properties of macadamia nut oil were studied. These include rheological properties, surface tension, spreadability, pour point, cloud point and solvatochromism. Viscosity of macadamia nut oil was found to be 40.42 ± 0.77 m.Pas.Sec. Surface tension was found to be 33.00 ± 0.33 m N/m, spreadability was found to be 8.2 ± 0.02 mm, solvatochromism was found to be 525.5 ± 0.29 nm, pour point was $-1.83 \pm 0.17^\circ\text{C}$ and cloud point was $0.17 \pm 0.17^\circ\text{C}$

KEY WORDS: Macadamia nut oil, Properties, Cloud point, Pour point, Spreadability, Solvatochromism, Viscosity

INTRODUCTION

Macadamia nuts contain oil more than 75 % of their weight, 9.0 % proteins, 9.3 % carbohydrates, 1.5 % moisture, 1.6 % mineral matters and 2.0 % fiber (Rick 1991, www.macnut.co.nz). The kernels of macadamia contain vitamin A1, B1, B2, niacin and essential elements such as calcium, iron, phosphorus, magnesium and potassium. The oil is a triglyceride oil and contains primarily monounsaturated fats up to 80-84 %. Macadamia oil contains the highest percentage of monounsaturates when compared to both olive and canola oils (www.macnut.co.nz). The macadamia nut based diet, high in monounsaturated fat and the moderately low-fat diet both have potentially beneficial effects on cholesterol and LDL in serum and reduce the risk of a

heart attack (Curb et al., 2000). Nuts are nutrient dense and most of their fat is unsaturated. They are also the best natural source of Vitamin E and are relatively concentrated repositories of dietary fiber, magnesium, potassium, and arginine, the dietary precursor of nitric oxide (Fraser 1999). Human feeding studies have demonstrated a reduction of 8-12% in low density lipoprotein (LDL) when almond and wall nuts are substituted with more traditional fats. Other studies show that macadamias and hazelnuts appear at least as beneficial as fats in commonly recommended diets. The idea of weight gain due to daily consumption of modest quantities of nuts is not certain, since preliminary data suggest that this is unlikely (Fraser, 1999).