

NUTRITIONAL PROPERTIES AND CONSUMPTION PATTERNS OF
GREEN LEAFY VEGETABLES

By

GIRAMBE GEDERA SHIRANI GUNASEKARA

Thesis

Submitted in partial fulfilment of the requirements

for the degree of

MASTER OF PHILOSOPHY

in the

POSTGRADUATE INSTITUTE OF AGRICULTURE

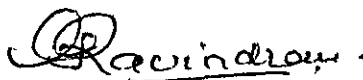
of the

UNIVERSITY OF PERADENIYA

SRI LANKA

Approved :

Supervisor


(Dr. (Mrs.) G. Ravindran)

Examiner


(Dr. W. Jayatilake)

Examiner


(Dr. S. Jayasekara)

January 1991,

C 641.354

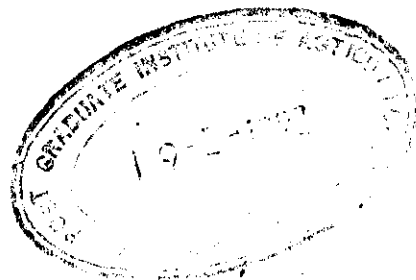
G75



424074

AGRICULTURE LIBRARY
UNIVERSITY OF PERADENIYA

424074x



ABSTRACT

Vitamin C content, mineral content and some anti-nutritional properties (oxalate and phytate) of fifteen Sri Lankan green leafy vegetables and their losses during home-level preparation (boiling, steaming and "Mallun" preparation) were investigated. A field survey was also carried out to assess the consumption patterns and methods of preparation of green leafy vegetables in an urban population.

The vitamin C content of the vegetables ranged from 3 mg in kankun (Ipomoea aquatica) to 235 mg in passion (Passiflora edulis) leaves per 100 g fresh material. Vitamin C was present in significant amounts in most of the leafy vegetables analyzed. Of the home-level preparation methods tested, greatest loss of vitamin C was observed during boiling. Losses of up to 32 and 54% were observed in 5 and 10 min boiling, respectively. An average of 35% loss was observed during "Mallun" preparation.

Almost all the green leafy vegetables contained high amounts of calcium, magnesium, iron and zinc. The losses of minerals were less compared to those of vitamin C. The losses ranged from 11% (potassium), to 26% (manganese) and from 20% (phosphorus) to 45% (manganese) during steaming and boiling, respectively.

The oxalate contents of leafy vegetables ranged from 1.6% in mukunuwenna (Alternanthera sessilis) to 9.7% in

spinach (Basella alba) on a dry basis. Major fraction (80%) of the oxalates was found to be water soluble. The average loss in total oxalate contents during boiling and steaming were 27 and 16%, respectively. The phytic acid contents of leafy vegetables ranged from 27.9 mg in gotukola (Centella asiatica) to 230.7 mg in wattakka (Cucurbita maxima) leaves per 100 g of dry material. Only a small proportion (3 to 28%) of the total phosphorus was found in the form of phytate phosphorus. The losses of phytates during steaming and boiling was small, ranging from 3 to 10%. The results of the field survey showed that green leafy vegetables are common components in the daily diets of people in the survey area. There was no seasonal effect with regard to consumption of leafy vegetables. Socio-economic factors such as income, and level of education had no influence on consumption patterns or methods of preparation. However occupation had a significant influence on consumption, because the unemployed group tended to consume more green vegetables than other groups. The data neither revealed any substitution effects, though it may be expected during price increases of other vegetables.

The survey results revealed a clear preference for mukunuwenna and gotukola. Storage conditions of the green leaves were largely determined by the level of income. Most of the (49%) respondents stored green leafy

vegetables by dipping in water. "Mallun" preparation that are less destructive to nutrients was practiced in most of the households (85%).