

Chapter I

INTRODUCTION



1.1 General

Tapioca, *Manihot esculenta* Crantz, also called cassava or manioc, is a starch producing tropical shrubby perennial root crop. It is the seventh largest producer of staple food in the world and, although it originated in the low land areas of meso-America, it is now ubiquitous and spreads to Africa and Asia. The plant propagates vegetatively by means of stem cuttings and adventitious roots, or tubers, radiate from the base of the cuttings. Tapioca grows in relatively poor soils, and it is high yielding compared with many other crops. If a tapioca crop is left too long, there may be marketing problems because of the oversized roots (which are usually unacceptable) increased fibre in the roots, and decrease in starch content.⁽¹⁾

Tapioca is an important export of Thailand. Last year (1976) tapioca earned roughly 6,800 million baht for the country, and this year the Board of Trade's estimates stop at 6,900 million baht with total tapioca product about 3.5 million tons. The plant from which tapioca is produced has increased from an

estimated 4.48 million rai last year to 8.25 million rai in 1977 an increase of 17 percent Tapioca became Thailand's second most important commodity (after rice) and there was speculation that it might even become the most important crop in near future.

1.2 Statement of Problems

The production of tapioca chips in Thailand is a relatively simple procedure consisting of cutting the root into chips and then spreading them on large concrete surfaces in the open air. Sun-drying periods usually required 2 - 3 days with periodical turning of the chips until the moisture content reaches 13 - 15 percent⁽¹⁾ which is acceptable to pellet manufacturers. However, drying periods are currently very short and the moisture content is rarely reduced below 19 percent. Sand and waste products, such as tapioca fibres, are often added to the chips to minimize the drying time and make the process economically viable. It is obvious that with this high moisture content, tapioca will constitute a favourable medium for the growth of bacteria and mould. Sun-drying method is also entirely dependent on the weather, the duration of drying and chips quality vary considerably.

1.3 Purpose of Research

The present study had, as its main objective, investigated the variables effecting the drying rate of the tapioca

chips by using through-circulation drying process. This study was also intended to find improved methods for drying tapioca chips. The method of investigation was to assess the influence of size of tapioca chips, air flow rate, hot air temperature and bed depth on the drying rate to seek the optimum operating condition and also some useful data for the future study.

1.4 Scope of Research

The detail of the scope of this work were as follows:

- a) to evaluate the influence of chip size, air flowrate, hot air temperature and bed depth on the rate of drying of tapioca chips.
- b) to seek the optimum operating condition by this artificial drying.
- c) to study the diffusion mechanism in the drying of tapioca chips, also the diffusion coefficient was calculated by Sherwood equation and Newman's method.
- d) to compare the results between sun-drying and through-circulation drying by using chips from Malaysian blade cutter.