CHAPTER I

INTRODUCTION

Yeast extracts consist of the content of yeast cells freed of yeast cell wall. It is concentrated form of product which consists of all the autolytically solubilized cellular components such as amino acids, nucleotides, polypeptide, proteins, glycogen, trehalose, sugars, B-vitamins and many unidentified flavor components (Hill, 1981). It is advantageously used as food additive and in industrial fermentations where it increases the nutritive values and vitamin content (Holder, 1977).

1.1 Available brewer's yeast

Brewer's yeast is the basic raw material for the yeast extract industry (Menegazzi, 1980). The yeast is produced as a by product from the brewing industry and it is a potential source of proteins of high biological value and other nutrients such as phosphorous and vitamin B complex. Spent brewer's yeast at Boon-Rawd Brewery Co., Ltd. is invariably obtained as a by product of normal brewing operation at a level of 3,000-3,500 hectolitre per month (Brewmaster of Boon Rawd Brewery).

Currently, the flocculant yeast produced in the beer production is only partially re-used in the fermenting process. Majority of the spent yeast is discarded as animal feed or land-fill.

The harvested yeast is thick, viscous, cream coloured, slurry of 20-30% total solid, 50% protein, 1-2% ash (results of Preliminary analysis).

1.2 Possible products from spent brewer's yeast

Because of its high biological value (Table 1-1), the slurry can be converted into a variety of preparation and products which are useful in laboratories and as ingredients in foods, feeds and fermentation media. Among the principal products are yeast invertase and β-galactosidase, soluble yeast component in liquid, paste, powder of granular forms, and isolated fractions of yeast cell constituents, such as protein and cell wall (Peppler, 1982).

1.3 Limitation of using unprocessed spent brewer's yeast

Recent rising cost of energy renders drying operation of brewers' yeast to be expensive (Batterham, 1982). Unheated yeast is not recommended for consumption by man or animal (Menegazzi, 1980). For human use it is also recommended that some extraction or purification should be carried out if consumption exceeds 10 grams per day, in order to eliminate potential disorders caused by factors such as nucleic acids (Maltz, 1981). Limited nutritional value of whole yeast cells can be improved by separation of the cytoplasmic material from the cell wall which is rough and resists intestinal digestion (Farnum et al, 1975).

It is therefore the intention of this research project to study the methods of producing yeast extract from spent brewer's yeast by autolysis.

1.4 Sequences of this research

The sequences of this investigation to produce yeast extract from spent brewer's yeast are as follows:

1.4.1 Review literature on methods of producing yeast extracts.

1.4.2 Characterize the nature of available spent brewer's yeast.

Table 1-1 Essential amino acid content of brewer's yeast, its protein concentrations and FAO reference protein (g/100 g protein) (Peppler, 1982; Pyke, 1958).

Amino acids	Brewer's yeast	FAO reference protein
Arginine	6.1	NR
Histidine	2.7	NR
Isoleucine	4.9	4.2
Leucine	6.4	4.8
Lysine	8.4	4.2
Methionine	1.8	2.2
Phenylalanine	4.3	2.8
Threonine	4.7	2.8
Valine	5.8	4.2
Tryptophan	1.5	NR

NR indicated that the analysis was not reported.

1.4.3 Investigate factors affecting the production of yeast extracts from available brewer's yeast.

1.4.4 Establish contact-equilibrium data of extraction.

1.4.5 Evaluate the yeast extract product.

Outline of overall scheme for experimental plans are shown in Figure 1-1.

1.5 Benefits of this research

The advantages that may be derived from this research work are as follows:

1.5.1 Acquire fundamental data on processing condition which enhance rupture of locally available brewer's yeast.

1.5.2 Promote exploitation of waste yeast for further economical and industrial development.

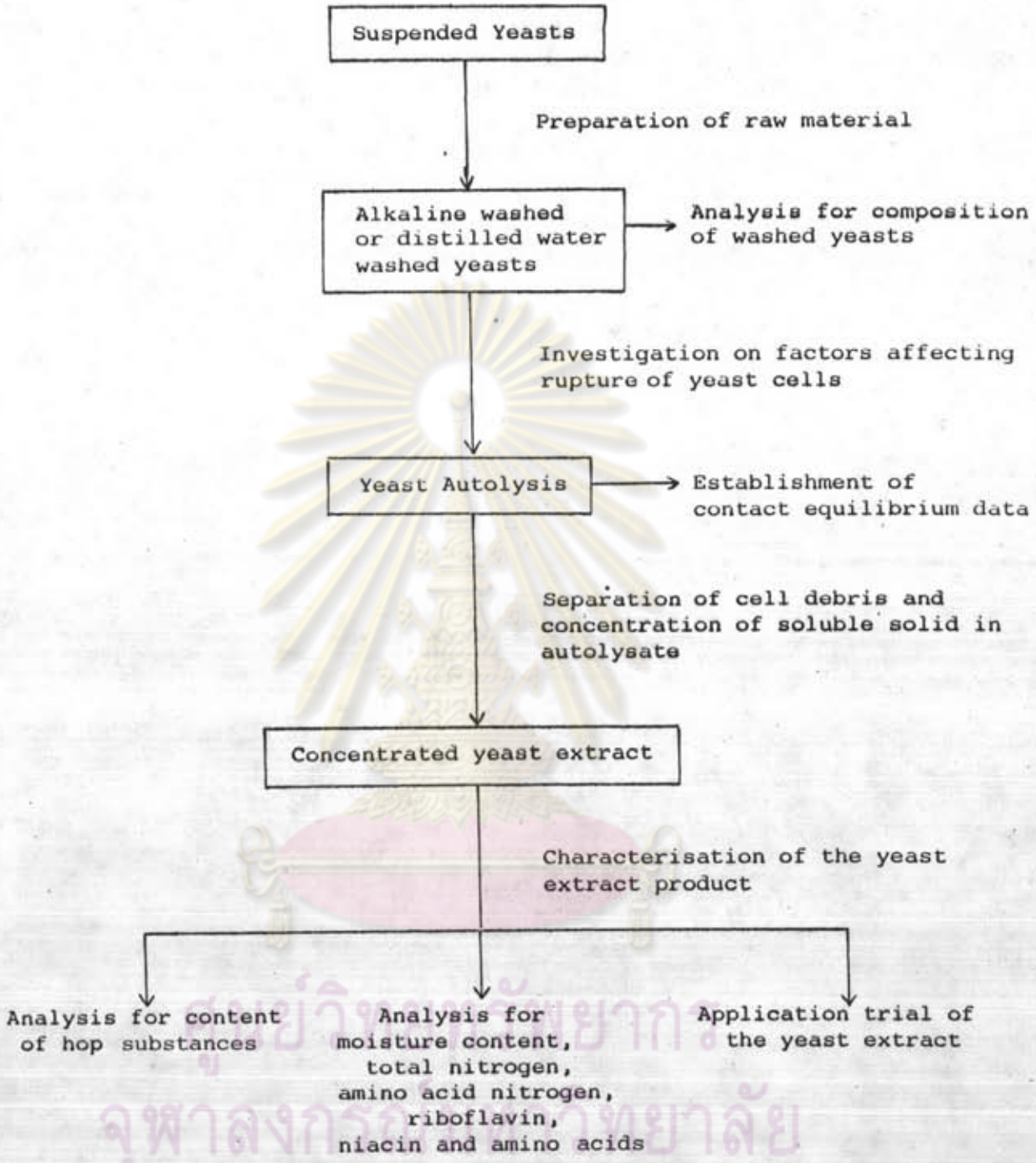

Figure 1-1 Outline of overall scheme for experimental plans