Food Chemistry **20** (1986) 153–156

Technical Note

Chemical and Functional Properties of Some Legume Powders

ABSTRACT

The study described in this Note was conducted on faba beans, chick peas and fenugreek in order to overcome the problem of beany flavor. Legume powders were prepared by soaking the seeds overnight in acidified water at pH 3, then cooking them at 121°C for 1 h and, finally, neutralizing them to pH 7. The resultant powders were investigated in terms of proximate chemical composition and some of their functional properties.

INTRODUCTION

Beany flavor is a well known disadvantage of using legume flour for fortification and substitution. Therefore, many studies have been undertaken to overcome this problem. Kon *et al.* (1974) investigated two methods for the preparation of two kinds of legume powders—regular powder and broken cell, or acidified, powder. Okaka & Potter (1979) found that soaking cowpeas in acidified water, followed by blanching, reduced the beany flavor of drum-dried cowpea powder.

The present study was carried out to characterize some legume powders in terms of proximate chemical composition, functional and technological properties.

MATERIALS AND METHODS

Samples of faba beans, decoated chick peas and fenugreek were purchased from the retail market in Alexandria, Egypt. Faba beans were

Food Chemistry 0308-8146/86/$03·50

TABLE 1
Proximate Chemical Composition and Some Functional Properties of Some Legume Flours and Powders

Legume	*Per cent moisture*	*Per cent on dry weight basis*				*Water absorption* (%)	*Fat absorption* (%)	*Oil emulsification capacity* (%)	*NSI*	*pH*
		Crude protein	*Crude fat*	*Ash*	*Carbo-hydrates*[a]					
Faba bean										
F	10·33	30·7	1·44	3·40	64·4	151	102	23	42·6	6·7
P	6·17	30·0	1·74	2·98	65·3	272	187	15	24·5	6·9
Chick pea										
F	9·78	25·8	6·25	2·83	65·1	120	91	20	40·5	6·6
P	4·74	25·7	5·90	2·86	65·5	284	178	16	14·6	6·9
Fenugreek										
F	8·40	30·7	7·62	3·75	76·0	487	123	27	24·6	6·6
P	5·05	29·9	7·32	2·81	60·0	352	190	37	14·3	6·7

F, Flour.
P, Powder.
NSI, Nitrogen solubility index.
[a] By difference.

decoated manually using a sharp scalpel. For fenugreek, whole seeds were utilized. Legume powders were prepared according to the method of Okaka & Potter (1979). Materials were ground, using a hammer mill to pass a 60 mesh screen. Moisture, crude protein, crude fat and ash were determined by the methods of the AOAC (1980). Water absorption, fat absorption and nitrogen solubility index (NSI) were determined as described by Hulse *et al.* (1977). Oil emulsification was determined according to Beuchat *et al.* (1975). All experiments were carried out in triplicate.

RESULTS AND DISCUSSION

The proximate chemical composition of the legume flours and powders studied is given in Table 1. It can be concluded that the method of preparation of legume powders had no significant effects on their proximate chemical composition when compared with their parent flours. Table 1 reveals that water absorption and fat absorption of legume powders were much higher than their corresponding flours. This is in accordance with data published by Narayana & Rao (1982) who found similar increases in both water absorption and fat absorption of winged bean flour after cooking. Table 1 indicates that preparation of legume powders decreased oil emulsification for faba bean and chick pea. In contrast, the oil emulsification for fenugreek powder was much higher than its flour. Nitrogen solubility indices (Table 1) of legume flours were much higher than those of their corresponding legume powders. This effect can be attributed to the denaturation of protein during the preparation of legume powders (Narayana & Rao, 1982).

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(Received: 13 August, 1985)