Comparative Evaluation of the Composition, Digestibility and Functionality of Chemically Modified Protein Isolates from Soya bean and some Under-Utilised Legumes



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INTRODUCTION

Native proteins, particularly those from indigenous under-utilized legumes have limited application especially in industrial food systems largely because of information dearth on their quality and functionality. Two under-utilized legumes, namely: Pigeon pea (PP) (*Cajanuscajan*) and African yam bean (AYB) (*Sphenosstylissternocarpa*) were processed into their protein isolates using alkaline (NaOH) solubilisation and acid(HCl) precipitation at their various isoelectric pH. The protein isolates were modified using acetic anhydride. The protein isolates and their chemically modified forms were thereafter analyzed with respect to their proximate composition, metabolizable energy (ME),*invitro*multi-enzyme protein digestibility(IVPD) and functional properties. The findings were compared with the

MATERIALS AND METHODS

Proximate analysis and functional properties were determined using the standard method of [1]. IVPD was done using the method of [2], extraction was by the method of [3] and acylation of protein was carried out as described by [3]





80 -



Figure 4:Functional properties (%) of modified protein underutilised isolatesFigure 5:Functional properties (%) of protein isolatesOHC=oil holding capacity;WHC= water holding;FC&FS=foaming capacity & stability;EC&ES= emulsion capacity & stability

DISCUSSION

The proximate composition parameters of protein isolates and modified isolates Figures 2 & 3 showed that fat of the convectional SI and underutilized AYB were higher than the corresponding modified. The CP, ash and IVPD of the SI were lower than the corresponding PP and AYB. Modification reduced the IVPD while little change was noticed in CP and CF after modification. Functional properties Figures 4 & 5 of the convectional SI showed better WHC, OHC and FS while FC and ES of the underutilized were lower than SI. However, modification of these isolates showed improved their functionality especially in EC and ES.

CONCLUSION

The study revealed practical relevance of these underutilized legumes as a good source of desirable quality protein source in food industry. The chemically modified

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