

**Referee's comments to
Doctoral thesis of
Ranjani Amarakoon, M.Sc.
"The effect of cooking on nutritive quality of selected legumes",
presented at
Faculty of Technology, Tomas Bata University in Zlín**

The doctoral thesis describes the nutritional aspects associated with several cooking procedures (cooking, microwave cooking, pressure-cooking) and partial germination and subsequent cooking for improvement of nutritive value of selected legumes (*Pisum sativum*, *Lupinus albus*, *Faba vulgaris*, *Glycine max*). The doctoral thesis consists of 105 pages that are divided into 95 pages of text and 10 appendixes. The text consists of three main chapters including Theoretical part (review of literature), Materials and methods and Results and discussion. References, Introduction, Scope of thesis, Lists of tables, figures and abbreviations, Conclusions and Contribution to science and practice form the integral part of thesis.

The first chapter "Literature review" gives condensed description of important legumes in Central Europe as and its chemical composition as a very common nutrient. Germination, soaking and cooking of legumes and their impact on digestibility in terms of main proteins are described. Method of processing and sample treatment, methods of analyses, and statistical methods are described in "Materials and methods" in details. Chemical composition, nutritional parameters of germinated legumes, and nutritional parameters of cooked legumes using different cooking procedures are evaluated experimentally in the "Results and discussion". Remaining chapters take up the issues outlined above.

The doctoral thesis provides a review of nutrient parameters like protein content (21-35%) with higher percentage of albumins. Albumin, globulin, prolamine, gluteine and residues (40-49, 38-42, 3-6, 3-7 and 2-8% of total proteins, respectively) were found. Protein digestibility of raw seeds (54-75%) was lower then that of cotyledons and radicles (> 80% and >86%, respectively) and therefore germination of legumes could be used as a simple and inexpensive method to improve the quality of proteins of legumes. Pressure-cooking and microwave cooking could also be recommended after soaking in 0.2% NaHCO₃ as the most effective and inexpensive method to improve the quality of proteins of legumes. Based on the nutritional parameters *P. sativum* could be alternative to *G. max*.

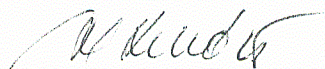
The doctoral thesis is written in relatively good English with many misprints (missing space between words, numerical value and unit etc., cat-ion see page 29, line 6 from bottom) and unusual terms. Legends to figures (see Appendixes) must be self-explanatory, description of axes are totally missing. There are too many digits in Table 3 (RSDs in units or tens %). Citation of publications of the author must respect scientific papers, posters and oral presentations on conferences. Citation of instrument manuals is very unusual (see cit. 112, 114). Non-uniform citation of literature (full titles/abbreviations of journals), Latin names of legumes (*G. max* vs. *Glycine max* – see page 47 lines 6 and 10 etc.), and some common terms (dry matter vs. DM – see tables, text) very often appears in the thesis.

The doctoral thesis includes the results interesting from the theoretical and practical point of view. Applicant demonstrated good knowledge of basic principles of food chemistry, food analysis and in nutrient issues and proved her ability to work independently and present results on the scientific conferences and in scientific journals. The results were presented at several conferences and two papers were submitted for publication in reviewed journals. The doctoral thesis fulfills the requirements of paragraph No. 47 of the Czech law No. 111/1998 Coll. I recommend the thesis to a defense procedure and after its successful defense confer the academic degree Philosophiae doctor (Ph. D.) to Ranjani Amarakoon, M.Sc.

Additional comments/questions:

- 1.) Do you know some more sensitive methods for determination of amino acids and what are the main advantages/disadvantages of the ninhydrine spectrophotometric detection.
- 2.) Define the appropriate number of digits in your results in case of RSDs equal 1 or 10%.
- 3.) What's the reason (chemical explanation) for improvement the "quality" of proteins of germinated and cooked legumes

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prof. RNDr. Vlastimil Kubáň, DrSc.,
Department of Chemistry and biochemistry
Mendel University of Agriculture and Forestry in Brno