

# NEW ALTERNATIVE FOR ASSESSING COOKING TIME OF COMMON BEAN PROGENIES

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**INTRODUCTION:** For a new common bean cultivar to be adopted by farmers and consumers, in addition to high yield, it must combine good culinary properties. Among them, cooking time is of greatest importance. In research, great stress has been placed on the identification of lines with shorter cooking time (Torga et al., 2011). The Mattson method was used in all these studies for characterization of this characteristic (Proctor & Watts, 1987). However, as there are hundreds of progenies to be evaluated in a common bean breeding programs, it is necessary to use a process for assessment of cooking time which is quicker and allows assessment of a large number of progenies. In light of the above, the purpose in the present study was to propose a new screening strategy for common bean progenies in relation to cooking time.

**MATERIALS AND METHODS:** The experiments were carried out at the Biology Department of the Universidade Federal de Lavras – UFLA (Federal University of Lavras), Lavras, MG, Brazil. Ten lines were evaluated, all of carioca type beans (beige with brown stripes). All these lines were collected in May 2012 from the same location. Before implementation of the tests, seeds from each line were classified for bean size, seeking to make each sample as uniform as possible. Cooking assessment was performed through two methodologies:

**Mattson Method:** The conventional method described by Proctor & Watts (1987).

**Pressure Cooker Method:** Each 100 grain sample was placed in a voile bag (Figure 1). These bags were placed in a pressure cooker which was kept heated for 10 minutes after the point at which the water began to boil (pressure cooker releasing steam). Next, the voile bags containing the samples from each line were incubated at 1-2 C° for 30 minutes. After that, cooking was verified using the JAB-77 minor type equipment, just to check if the beans were cooked or not. This procedure was performed ten times. Thus, the percentage of grains cooked from each line was estimated.

**RESULTS:** To apply the new common bean cooking assessment methodology, some initial steps were carried out. One of them was to check what the minimum cooking time would be to reveal a difference among the lines tested. Ten minutes proved to be the optimal time that would allow best screening of the lines. As the beans in the voile bag are hot, they are removed from the pressure cooker and placed in the refrigerator for 30 minutes. It is recommended that the voile bags with the bean samples all be placed in contact with the bottom of the pot to avoid a possible effect from position in the container.

The experimental accuracy of the two processes was very similar, observed by the accuracy estimate (Table 1). In the Mattson method, it was not possible to identify groups of inbred lines, whereas in the pressure cooker method, the lines were classified in four groups, according to the percentage of beans perforated after ten minutes in the pressure cooker. The most quickly cooked line was CNFC11965 and the worst was EMB4.

This new methodology has some advantages, namely: i) It is possible to assess a large number of progenies simultaneously. If necessary, more than one pressure cooker may be used; ii) The procedure is easier and quicker than that of Mattson. In addition, it is not necessary to soak the beans in water beforehand; iii) The methodology establishes a cut-off or truncation point; above this time the line/progeny is considered to be worse for cooking. This is exactly the information breeders need for and selection of progenies. This time may be previously determined by the researcher; iv) What is done is exactly what homemakers do on a daily basis in relation to cooking beans. Therefore the results reflect the cooking procedure better than even the Mattson methodology.

Table 1. Mean percentage of beans cooked by the pressure cooker method and mean cooking time by the Mattson method of common bean lines. Lavras, Brazil. 2012.

Cultivar	Method	
	Pressure cooker	Mattson
<i>CNFC11965</i>	100 <sup>1</sup> a	25.7 <sup>2</sup> a
<i>BRSMG MADREPÉROLA</i>	76.7b	33.6a
<i>PI8163</i>	73.3b	27.3a
<i>RCII219</i>	56.7c	30.6a
<i>EMB9</i>	53.3c	28.9a
<i>BRSMG TALISMA</i>	50.0c	24.7a
<i>CNFC10432</i>	46.7c	28.2a
<i>BRSMG MAJESTOSO</i>	43.3c	27.8a
<i>VC21</i>	26.7d	30.3a
<i>EMB4</i>	23.3d	29.8a
<b>Mean</b>	<b>55<sup>1</sup></b>	<b>28.7<sup>2</sup></b>
<b>Accuracy</b>	<b>96.1</b>	<b>85.3</b>

<sup>1,2</sup>: Percentage of beans perforated after 10 minutes of cooking in a pressure cooker and given in minutes respectively. Mean values followed by the same letter in the column do not differ by the Scott Knott test at 5% probability.



Figure 1. Steps in assessment of cooking time by the pressure cooker method.

## REFERENCES

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