In-Vitro carbohydrate and protein digestion of three selected varieties of puffed rice

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Abstract

Rice is the staple in the diet for much of the world. Due to its acceptance and versatility, rice has been used to prepare different processed ready to eat food that are easy to consume and tasty. One such processing technique is puffing, where the rice kernels are puffed using high temperature. The In vitro digestibilities of the three varieties were carried out, to observe the digestibility of carbohydrate and protein. The in vitro carbohydrate digestibility in RNR 2458 (82.21 %) was observed to be highest and lowest in WGL 283 (80.28%). The in vitro protein digestibility in WGL 44 (86.30%) was observed to be highest and lowest in RNR 2458 (82.67%). The nutritional analysis also found better results with WGL 283 as in vitro digestibility content was better than others.

Keywords: rice kernels, puffing, in–vitro digestibility

Materials and Method

The three rice varieties of Telangana state WGL44, WGL 283 and RNR 2458 was puffed by a traditional method of puffing (Edmund and Lloyds, 2002) [1]. The in vitro carbohydrate and protein digestibility of three rice puffed products were estimated by the following procedures.

In-vitro carbohydrate digestibility: The ability of the sample to inhibit alpha- amylase activity was determined by the method given by Englystelal (1992) [4].

In-vitro Protein digestibility: The digestibility of rice puffed products was determined by the method by Aboubacar et al., 2001 [5].

Result and Discussion

The in vitro carbohydrate digestibility of the three rice varieties WGL 44, WGL 283 and RNR 2458 ranges from 80.28 to 82.21%. The highest digestibility of carbohydrate was observed in RNR 2458 and the lowest digestibility was observed in WGL 283. Fig. 1 shows the invitro carbohydrate digestibility of the three varieties of puffed rice. The in vitro carbohydrate digestibility in WGL 44 was 81.31 %. There was significant difference (≥0.05%) in the in vitro carbohydrate value between the three varieties of puffed rice.

The in vitro protein digestibility of the three rice varieties of Telangana state WGL 44, WGL 283 and RNR 2458 are 86.30, 83.60 and 82.67% respectively.
The *in vitro* digestibility of protein was observed to be higher in WGL 44 and lowest in RNR 2458. The *in vitro* digestibility means of the three varieties are shown in the Fig 2. There was significant difference (≥0.05%) in the *in vitro* protein digestibility value between the three varieties of puffed rice. Lower protein digestibility was reported in wheat based extrudate products ranging from 59.26 to 65.61% (Swapnil et al., 2016) [7]. The difference in the results might be due to the difference in the content of wheat and rice and also their digestibility after processing.

![Fig 1: In-vitro carbohydrate digestibility of the three varieties of puffed rice](image)

![Fig 2: In-vitro protein digestibility of the three varieties of puffed rice](image)

**Conclusion**

Among the many states in India, Telangana state has contributed largely to supply of rice to the country. A variety of rice products are produced in order to enhance the storage capability, easy cooking to instant cooking and provide new food with better nutritive value and flavour. The three selected puffed rice varieties were then subjected to *in vitro* digestibility test to observe the *in vitro* protein and carbohydrate digestibility. The *in vitro* carbohydrate digestibility of varieties WGL 44, WGL 283 and RNR 2458 were 81.31, 80.28 and 82.21% respectively. Then these three varieties were tested for *in vitro* protein digestibility, the digestibility of WGL 44 was 86.30%, the variety WGL 283 was 83.60% and RNR 2458 was 82.67%. The variety that has shown to has the highest level of digestibility on an average was WGL 283.

**Reference**