

Physiological cost of parboiling of rice - A food processing activity performed by farm women

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■ **ABSTRACT** : Parboiling of rice is a common food processing activity performed predominantly by women in the villages of Assam. Parboiling is done mainly for preparation of indigenous food items such as parboiled rice, puffed rice, flaked rice etc. with conventional tools and is highly time consuming and laborious activity. An attempt was made to assess the physical fitness of respondents, physiological workload, muscular and postural stress involved in the process of parboiling of rice. Rating of perceived exertion (RPE) was calculated using Borg's 5 point rating scale. Body map was used to identify pains in different parts of the body. Twenty rural women without any health problem in the age group of 21-45 years were selected for this experimental study. Physical characteristics of the respondents involved in parboiling of rice revealed that the average height and weight were 150.30cm and 47.70 kg, respectively. Lean Body Mass (LBM) of the respondents was 29.6 kg. Aerobic capacity (VO_2) and fat percentage of the women were found to be 29.80 ($ml \cdot kg^{-1} \cdot min^{-1}$) and 19.61. Results indicate that working heart rate and energy expenditure of the respondents with conventional tool were 104 $b \cdot min^{-1}$ and 7.70 kJ/min, respectively. On the basis of average and peak heart rate and energy expenditure, the physiological workload of parboiling of rice was categorized as 'moderately heavy'. Average rating of perceived exertion (RPE) was 3.2 in 5 point scale. The angle of deviation of respondents was 7°. The incidences of musculo-skeletal problems were observed to be 'severe' to 'moderate' in different parts of the body. Majority of the respondents (83 %) experienced pain in shoulder joint, lower back, upper arm, lower arm, hand and wrist. Use of conventional tool as well as poor work station compelled the farm women to adopt awkward postures while performing parboiling activity. Ergonomic interventions are required to enhance work efficiency and comfort level thereby reducing health hazards of farm women.

■ **KEY WORDS** : Physiological workload, RPE, Parboiling

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Parboiling of rice is a common food processing activity performed predominantly by rural women of Assam throughout the year. Parboiling is done mainly for the preparation of parboiled rice and also for indigenous food items like puffed rice, flaked rice, etc. The nutritive value of parboiled rice is more than unprocessed rice. It is usually done in open space on three stoned chulah on a big iron *kadhai*. After parboiling, the parboiled rice is drained with the help of a bamboo basket which is not designed ergonomically. Thereby increases various health hazards and physiological workload of farm women. The farm women engaged in

parboiling often complaints of pains and burning sensation due to heat in different parts of the body. The smoke filled work environment and the use of poorly designed conventional tools during parboiling process undoubtedly results in stress and fatigue of the workers.

Knowledge on physiological cost of work in terms of heart rate and energy expenditure of rural women will be of great use in providing necessary changes required in the work environment, work place and methods of performing the task. Therefore, in this paper, an attempt was made to assess the physical fitness of farm women, physiological workload,