

# Hedonic ratings and consumption of breakfast among recruits in basic recruit training (BT)



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## BACKGROUND

The soldiers lacked of energy and nutrient intake, especially during BT (Consolazio, Matoush, Johnson, Nelson, & Krzywicki, 1967; Moore, Friedl, Kramer, Martinez-Lopez, Hoyt, Tulley, DeLany, Askew, & Vogel, 1992). It is questioned whether the energy intake was adequate for energy requirements at each Phase 1, Phase 2 and Phase 3 BT. Lack of energy and nutrient intake cause body mass loss and lowered the soldier's performance, which may lead to attrition during BT (Lee, McCreary, & Villeneuve, 2011; Niebuhr, Scott, Li, Bedno, Han, & Powers, 2009). In the study of Ismail and colleagues (1996), the Malaysian soldiers did not consume adequate nutrients not because of insufficient food were given to them but due to low food acceptance. Menu was planned based on the regulation in the Order of the Military Council, *Perintah Majlis Angkatan Tentera* (PMAT) Malaysia. The catering was supposed to cater food only for the other ranks and young soldiers in the based camp and military training centre. They did not cater food for the army officers and soldiers in the operations. However, during the menu planning process, menu was designed based on the preferences of the army officers (Zainon, Menu Planner, personal communications, December 13, 2010). It is argued whether the menu suits the preferences of other ranks and young soldiers, especially during BT (Marshall & Meiselman, 2006). This study examines this research question, what is their food acceptance during BT at breakfast?

## OBJECTIVES

To examine the relationship between hedonic ratings and the consumption of the breakfast foods

## METHODS

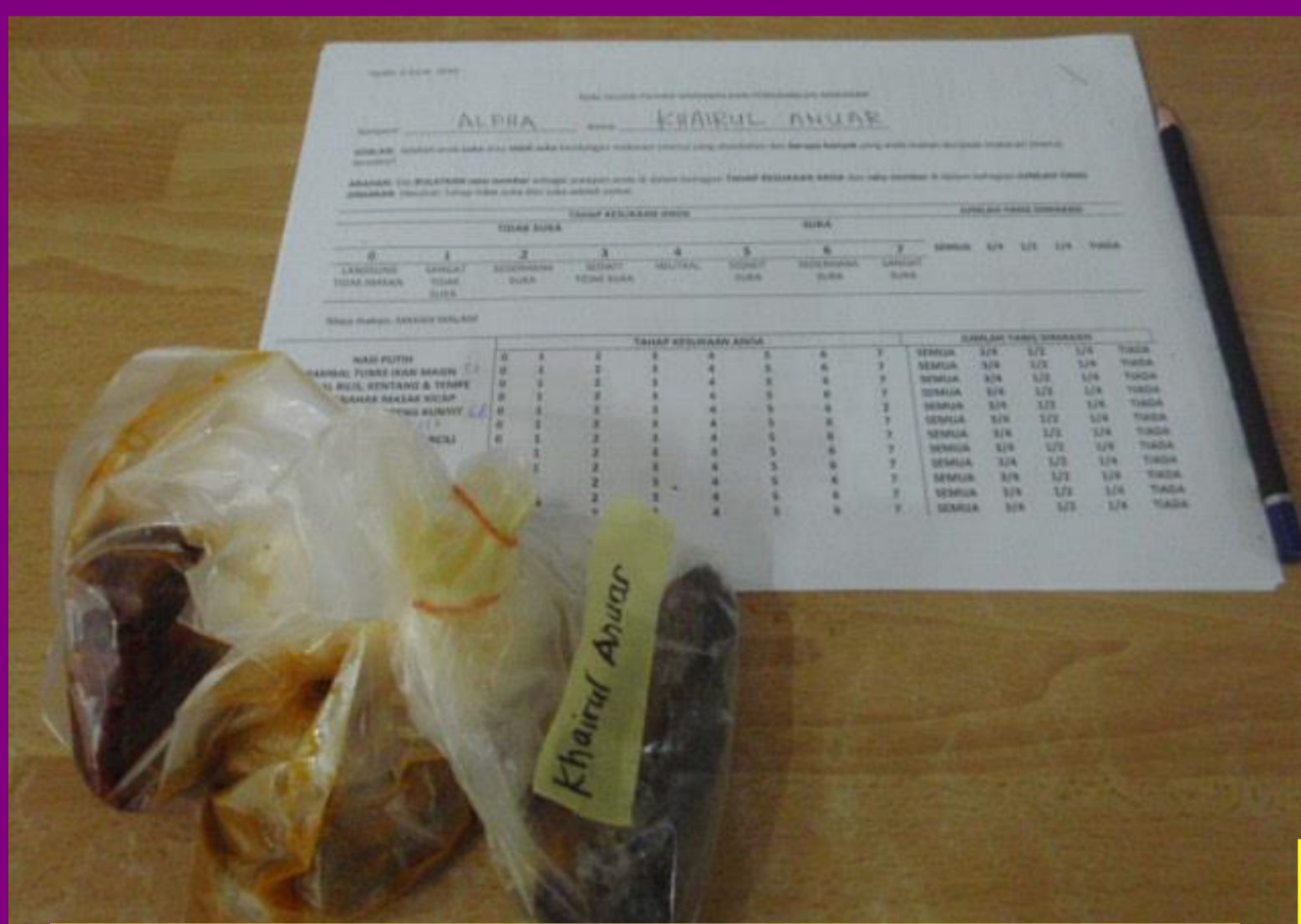
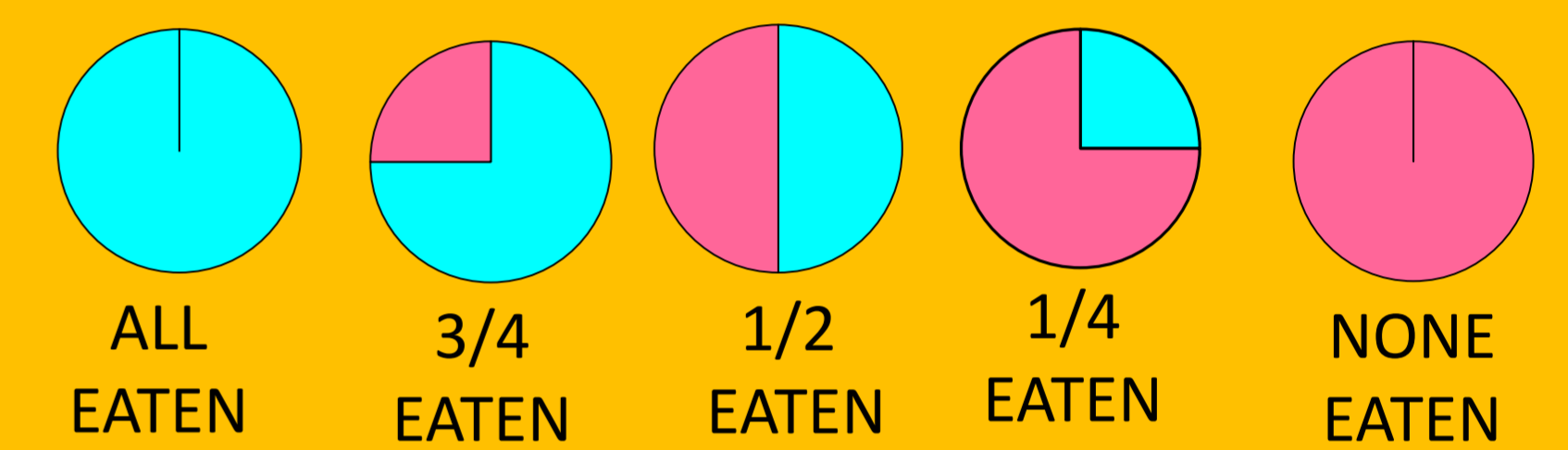
ARMY RECRUITS SERIES A

INFORMED CONSENT

FOOD ACCEPTANCE QUESTIONNAIRE  
(Edward et al., 1988)

A pre-tested questionnaire for 24 hour Arctic ration packs was adopted to determine the hedonic ratings of the young soldiers and modified to 9-point scale (where 1= dislike extremely to 9= like extremely). This questionnaire consisted of a number of 30 breakfast food items administered to test respondents. Soldiers were asked to rate the food based on the hedonic scale. All foods and drinks provided by the catering were rated from 1 (extremely disliked) to 9 (extremely liked), with a score of 5 set as acceptable score. The researcher circled the relative amount eaten of each food items and drinks in a menu, which reflected the proportion or number of a particular food eaten, with one of the following alternatives: none, 1/4, 1/2, 3/4 and all, after the soldiers had left the meal trays. If none of the food proportion was taken, it means that the food was handed out, but nothing was eaten of it.

## PROPORTION OF FOOD/DRINKS CONSUMED



FOOD ACCEPTANCE QUESTIONNAIRE



RESEARCHER WITH THE FEEDBACK FROM RECRUITS



AFTER MEAL CONSUMED

## ABSTRACT

This research is to examine the relationship between hedonic ratings and the consumption of breakfast food during basic recruit training. Hedonic ratings of breakfast items belonging to 30 food items provided by the catering were collected from 50 recruits, over 2 months. All foods and drinks provided by the catering were rated from 1 (extremely disliked) to 9 (extremely liked), with a score of 5 set as acceptable score. During the subsequent breakfast, the leftovers of each individual and menu item were recorded. Hedonic responses to breakfast food items differed significantly [ $F(29) = 103.62, p < 0.05$ ]. 53.3% of breakfast food items were scored from 5.12 to 8.52. Honeystar cereals (score 8.52) and nasi lemak (score 8.10) were liked very much with more than 90% of consumption. The least liked breakfast food was kway teow soup with score of 1.58. A significant and high correlation was found between hedonic scores and food consumption of breakfast food items ( $r = 0.725$ ) ( $p < 0.05$ ). In conclusion, hedonic ratings of recruits predicted the amount of breakfast consumption. Low ratings of breakfast food items raise the question on how the breakfast food should be served to encourage their consumption in recruits during training.

## RESULTS

Table 1 shows the hedonic scores and food consumption for breakfast foods. Hedonic responses to breakfast food items differed significantly [ $F(29) = 103.62, p < 0.05$ ]. 53.3% of breakfast food items were scored from 5.12 to 8.52. Honeystar cereals (score 8.52) and nasi lemak (score 8.10) were liked very much with more than 90% of consumption. The least liked breakfast food was kway teow soup with score of 1.58. A significant and high correlation was found between hedonic scores and food consumption of breakfast food items ( $r = 0.725$ ) ( $p < 0.05$ ).

The study revealed that food acceptance had influence the food intake at breakfast during basic training. Results from the questionnaire discovered that sensory scores of the food were mostly rated dislike from score of 1 to 4. Some of the food were acceptable and slightly portion of the food received high rating of 8 (very much liked), for example nasi lemak, honeystar cereal, chicken rice and ice cream. The rest of liked food was rated up to like moderately. Most of them commented that taste was an

Breakfast food items	Hedonic response (Mean±SD)	Amount consumed (%)
Honeystars cereal	8.52 ± 0.07 <sup>a</sup>	93.0
Nasi lemak	8.10 ± 0.12 <sup>a</sup>	91.5
Koko krunch cereal	6.86 ± 0.13 <sup>b</sup>	90.5
Chicken burger	6.84 ± 0.16 <sup>b</sup>	86.6
Chicken sausage	6.72 ± 0.17 <sup>bc</sup>	82.5
Fresh milk	6.56 ± 0.14 <sup>bcd</sup>	80.8
White bread	6.48 ± 0.15 <sup>bcd</sup>	66.3
Seri kaya	6.06 ± 0.11 <sup>cde</sup>	66.3
Jam (Pineapple)	5.92 ± 0.14 <sup>def</sup>	66.3
Chapati with dal curry	5.52 ± 0.10 <sup>efg</sup>	66.2
Soto nasi	5.50 ± 0.07 <sup>efg</sup>	65.5
Peanut butter	5.46 ± 0.16 <sup>efg</sup>	64.2
Chinese fried rice	5.33 ± 0.20 <sup>efgh</sup>	63.8
Kampung fried rice	5.28 ± 0.17 <sup>fghi</sup>	63.5
Nasi himpit kuah kacang	5.22 ± 0.19 <sup>fghij</sup>	62.0
Melayu fried rice	5.12 ± 0.25 <sup>ghijk</sup>	61.8
Butter	4.92 ± 0.16 <sup>ghijk</sup>	61.3
Curry noodles	4.62 ± 0.18 <sup>hijkl</sup>	61.0
Fried noodles	4.54 ± 0.13 <sup>ijklm</sup>	59.3
Fried vermicelli	4.50 ± 0.19 <sup>ijklm</sup>	58.0
Meehoon siam	4.43 ± 0.19 <sup>klm</sup>	56.2
Margarine	4.40 ± 0.15 <sup>klm</sup>	55.2
Singapore style fried vermicelli	4.02 ± 0.18 <sup>lmn</sup>	54.0
Mee rebus	3.94 ± 0.17 <sup>lmn</sup>	50.2
Roti canai with dal curry	3.84 ± 0.15 <sup>mn</sup>	37.1
Mamak fried noodles	3.58 ± 0.11 <sup>n</sup>	36.0
Lontong and sambal	3.56 ± 0.71 <sup>n</sup>	34.0
Fried kway teow	3.52 ± 0.01 <sup>n</sup>	33.5
Cornflakes cereal	3.44 ± 0.08 <sup>n</sup>	31.5
Kway teow soup	1.58 ± 0.02 <sup>o</sup>	5.0

Top 4 favorable breakfast foods by recruits



HONEY STARS



NASI LEMAK



BURGERS



KOKO KRUNCH

## CONCLUSION

In conclusion, hedonic ratings of recruits predicted the amount of breakfast consumption. Food acceptance played a major role in determining the food intake during training, with priority on the sensory attributes of the food served. Low ratings of breakfast food items raise the question on how the breakfast food should be served to encourage their consumption in recruits during training. Results from the study may provide the menu planners with other alternative to tackle under consumption of food during BT.