

Food and Malaysian Climbers at High Altitudes

*Roslina Ahmad, Mohd Salehuddin Mohd Zahari, Zulhan Othman,
Muhammad Izzat Zulkifly, Noriza Ishak and Mohd Hafiz Hanafiah*

Faculty of Hotel and Tourism Management,
University Technology MARA, Shah Alam, Selangor, Malaysia

Abstract: The suitability of food taking besides others provisions is one of the vital elements to be considered for the high altitude mountain climbers to combat with the common symptoms of physiological changes like Acute Mountain Sickness, nauseous, breathing difficulties including appetite suppression and reduction of taste. This paper report the experiences of 2007 Malaysian Everest expedition teams with regard to the types of food consumed particularly during the last phase of the expedition before conquering the peak of the great mountain.

Key words: Food • Malaysian climbers • High altitudes

INTRODUCTION

Extreme sports and recreation activities like climbing, trekking and skiing at high altitudes environment have long been practicing and continually getting popular in this present day [1]. This is evident when nearly quadrupled climbers in the Himalayan in the last five years and 10,000 are exploring the Alpines each year [2]. The Himalayan, South American Andes and the Tibetan as many climbers known promise excitement to those in search of adventure, thrills, buzz and some spent such sojourn from a few weeks to a few months at those areas [3, 4]. There is no denying the fact that such activities hit and amazed the climbers but high-altitude exposure particularly at elevations greater than 3500m could also lead to several physiological changes.

Individuals who ascend to high altitude environment invariably develop Acute Mountain Sickness (AMS) like nauseous, breathing difficulties, headache, loss of appetite and concomitant weight loss [5]. These sicknesses are common phenomenon for the climbers and it depend on a number of factors including the speed of ascent and relative fitness and usually occurs as early as the first six hours of acclimatization [6]. During the expedition the energy expenditure and calorie intake are tremendously increase due to difficult terrains, cold environments and heavy clothing. Appetite suppression and reduced of caloric consumption as triggered by hypoxia weight losses are also widely reported of high altitude sojourns [7]. Scientifically, hypoxia is a condition

caused by reduced barometric pressure which affecting body's ability to transfer oxygen from the lungs to the bloodstream. For whatever reasons, food and nutritional intakes is one of the key elements to match up those climbers' physiological changes and completing their high altitudes grueling activity [8].

There is vast suggestion concerning nutrition and ideal diets at high altitude. As such, individuals should intentionally overeat prior to climbing to counteract the effects of weight loss. However, researcher [5] revealed that much of those suggestions are still anecdote and unproven. In other words, although there are best suggestions on diet, the climbers are still forced to carry on the effects of hypoxemic effects (appetite suppression) which are simply explain as to why energy intake is declined [9]. Appetite suppression, altitude also reduces sense of taste and alters food preferences due to the decrease tolerance to monotonous foods [10]. Researcher [11] recommended for the climbers to have variety of foods such as oatmeal, instant mashed potatoes, instant rice, ramen noodles and vanilla pudding during the expedition.

Other captivating factors explaining the weight loss among climbers are low carbohydrate intake and dehydration. It is proven that a high-carbohydrate diet can reduce the inception and severity of AMS [12] and weight loss as it replace worn-out muscle glycogen stores and further preventing protein from being used as substitute energy [11]. However, it is interesting to note that climbers feel significantly less hungry and a

significant decrease in the strength of desire to eat [12]. Perhaps, it is useful to take this finding as one of the concerns in this study. As for fluid retention, climbers' requirement for water is usually very high at altitude which often exceeding 4 liters per day [11].

Another intriguing fact which considerably contributes to weight loss among the climbers has got to do with the lack of time to prepare foods as cooking at a high altitude require several special considerations [13]. As mentioned earlier, altitude modifies one's food preferences. The U.S Food safety and Inspection Service suggests that variety of foods (liquid or solid foods) should be made available for the climbers and to some extent cooking is required. The problem is, as the altitude increases and atmospheric pressure decrease, the boiling point of water decreases and as a result, cooking time increases. Conceivably, this is answering why climbers do not have time to wait just to eat in time-restricted and energy-draining expeditions.

To date, there vast ranges of high altitude literatures related to food and nutritional intake [14-17, 8, 6] however most of them were produced or undertaken by the western researchers. There is no such attempt made by the Malaysian researchers on this subject despite a few of Malaysian climbers have successfully conquering many popular peaks including the great Mount Everest. The first 2004 Everest expedition team expressed that diet besides other matters is one of the most importance element for climbers in maintaining their body weight, mental and physical alertness at high altitude. Most of the team members were reported of experiencing excessive weight loss due to less suitable food consumed. As reported, the last phase to the peak of Everest was the most critical and the hardest part for the climbers not only it taken so much time, energy but the type food taken also play an important role to increase and maintained the energy. Several alternatives have been taken to overcome the problems including consumed common food recommended by sherpas' nevertheless it would not help to catch climbers appetite. In fact, similar scenario occurred to other nation climbers. In line with this, some of the Malaysian climbers stuck and surrendered before reaching the peak caused by diarrhea due to unsuitable food consumed. This occurrence raises questions of what are the best foods for the Malaysian climbers in high altitudes environment particularly at the highest peaks. With that, this study aims is gathering the facts and information on the most suitable food that fits to the Malaysians climbers based on antecedents of 2007 Malaysian Everest expedition teams and subsequently validates the information through the development of the food products.

Table 1: Items used in the interview

Items	
1.	Generally, what do you think about your Everest expedition?
2.	What are the complications faced during the expedition?
3.	Do you have problem relating food consumption during the expedition?
4.	What are the most suitable food for the Malaysian climbers?
5.	Based on your experiences, what should we do to improvise the suggested foods?

MATERIALS AND METHODS

In the tracking the experiences related to the types of food during the expedition, members of 2007 Malaysia Everest expeditions' team were chosen as a study sample and five pre-determined set of questions were developed ranging from the general nature to the specific questions relating to food. The questions are shown in the following table (Table 1).

With that, all seven climbers were contacted in acquiring their willingness to be interviewed together in one session. The dates, times for the interviews were then arranged. Nevertheless, the official doctor and nutritionists for the team and four climbers were presence with two others unable to attend. In absent of any obvious problems, the interviews were successfully undertaken with the full cooperation and lasted between one to two hours and the session was the tape-recorded.

ANALYSIS AND RESULTS

All the information gathered through the interview with official doctor and four other climbers were transcribed into a text. This is the part where all the words, expressions, pausing were stated in the text form clearly and definitely like the 'voice' form one. The process was done properly to prevent any important ideas missing. With that, the profiles of the 2007 Everest climbers who participated in this study are highlighted. Three out of five climbers (Climber A, B and C) were the graduates of University Teknologi MARA and their age was 25 years during expedition while the team leader and the official doctor are also lecturers from the same university. The expedition was part or conjunction with Malaysia's 50th independence anniversary celebrations.

General Experience of Everest Expedition: The first question asked related to general experience on the expeditions. All five key informants have given almost identical answers. The opportunity for being selected and part of the expedition team grant great experiences for

them with thousand good memories and distressing moments. The expedition was the biggest adventure and perhaps most serious undertaking activity in their life. The team leader for instance said;

“It is awesome; reaching the top of mountains after hustle and bustle was an exhilarating experience. We are talking about the highest mountain in the world (Mount Everest). It’s a lie if we don’t feel proud of ourselves. This is a great achievement not only for us but the country as well and for me among great outdoors activities, climbing Mount Everest is the most extreme sport I’ve ever had in my life. It’s memorable”.

Climber a Added That: *“Climbing the highest mountain in the world (Mount Everest) is hell of activity. It calls for mental, strength, motivation and patience because the risk of death is also significant. As reported, over 200 peoples have died in Mt. Everest and some of them were among the best climbers in the world. Alhamdulillah, with good intention, god safe us”.*

In supporting the notions, climber B which is the first Malaysian woman in that expedition team claimed that:

“Apart from mental, strength, motivation and patience, training, level of teamwork, communication among the team members, understanding and supports for each other are the major factors contribute to our victory. Without these elements, I think we couldn’t reach the peak”

Complication During the Expedition: The second questions tracked the difficulties faced by the climbers during the expedition. Climbers and team doctors unanimously agreed that complications varies from one stage to another as they had to be at five different camps before getting opportunity to be at the peak of the mountain. Of all, the obvious complications were dealing with physiological changes. On behalf of climbers, the team doctor revealed that;

“At the beginning of the expedition, it was good to see that all climbers were still in a great condition without any serious crisis. However, the situation turned bad when we arrived at the base camps and it got worse at the remaining camps. The symptoms became even more dangerous”.

He Further Noted: *“At that time, the condition was really terrible. We were suffering conditions such as lack of oxygen with extremely low temperature of atmosphere. We felt tired, some sort like hmmm... lazy and sometimes*

de-motivated and moody. Even my weight dropped about 16 kilos in just two months at the base camp. We also lost too much water through dehydrations. It’s expected actually, because it happened to most of the climbers”.

The above statements clearly indicate that every individual in the team were suffering the high altitude symptoms. This is parallel with the notions given by previous study [12: 11: 5] which revealed that humans will face a condition called Hypoxia at high altitude which lessen their body systems to run efficiently. This is due to the lost of so much energy caused by lack of oxygen allowing Acute Mountain Sickness (AMS).

Problem Relating to Food Consumption: As central focus of this study is on food, it is important to understand the problems related to it. When asked about the food, climbers and the doctor again in agreement that they were not only lost their energy and water but losing appetite or lessening interest to eat in every check points during the expedition.. This was even serious after the base camp. At this point, they took extremely less food although their body needs a very large amount of it to replace the energy lost. Despite that, it is interesting to note the reasons given were slightly also associated to the types of food consumed.

Climber C Reacted to the Question by Saying: *“At the base camp, despite having AMS, we managed to eat our local dishes a few times although in the small quantity. Nevertheless, the scenario totally changed as we moved farther. From the base camp to other check points, we carried only a few important rations like packet foods or something lighter in weight. We were obviously continuing losing energy and appetite as we approached much higher altitude. That was the time when we really missed our foods. Of course, when your appetite is down, you will look for something that can boost up the diets. Other foods can’t bring the limelight. We’ve tried them (other foods) but to no avail”.*

The Team Doctor Added That: *“I’ve once cooked ‘Nasi Goreng’ while we were still at the base camp. I was glad everything finished out even with simple ingredients. Unfortunately, I could not keep on with the idea while moving to the other camps because we couldn’t carry many things”.*

Climbers and doctor were supporting each other that those climbers from other regions were having the same feelings about the food. The team leaders for instance explained that;

“They were just like us. They prepared foods that suit their taste buds and supply large amount of energy. We saw the Nepalese prepared garlic and tomato soup to warm their body. Those were actually kinds of food that they have every day and they looked more energetic than us. It might has been the reason why they were not keen to have any other dishes during the journey”

Climber B Further Noted That: *“We also brought some readymade foods. Due to the altitude and temperature of the area, they however lost their structure, tasteless which in turn facing acute appetite suppression. This was a real challenge to us as we really need balanced diet in maintaining our physical and mental performance to reach the top”.*

What could be said from the information gathered is that weight loss, appetite suppression and eating disorders are the common symptoms at the high altitudes. Nevertheless, providing energy food that suit to the taste buds and in this context Malaysian food could slightly ease up the appetite suppression among the climbers. This is in line with notion noted that suitable diets with balance nutrients slightly stimulate appetite during the expedition [18].

The Revealing of Dates or ‘Korma’ and Raisins: Based on popular belief, the last phase to the peak of Mount Everest was the most critical and the hardest part for the climbers not only it taken so much time and energy but the type of food taken also play an important role in increasing and maintaining the energy. With this notion, climbers were probed on the types of food carried and consumed during this. Together, the doctor and team members claimed that dates and raisins are the food makes them survived to the top. On behalf of other climbers, the team leader posited that;

“As we were approaching the peak, we only carried water and small types of food or bites size. This was due to the extreme condition to the extent that at times we only relied on ropes. At this point, the type of food carried and consumed are matters. It is proven in my case of 2004 expedition where I had diarrhea due to unsuitable food consumption. It was so frustrating because I was just 300 to 400 meters away from the peak! Luckily, in 2007 we were supplied with the right food (plain dates or kurma and raisins) and Alhamdulillah it’s worked.

When asked on how dates and raisin came into the picture, the team doctor proudly explains;

“It’s all started in 2004 expedition when I brought small amount of plain dates and raisins. At the fourth camps, most of the climbers kept complaining of losing appetite and getting weak. Most of them felt like chewing something akin to cookies just to restore their energy. So, I gave them dates and raisins just to get them in the mood. Subsequently, it was obvious to feel that those raisins worked as the energy supplier. They refreshed us and made us slightly energetic. For the 2007 mission, we brought slightly bigger amount dates and raisin.”

Suggestion for Improvisation of Dates and Kurma Fruits:

From the aforementioned discussion, climbers and doctors claimed that dates and raisins have done wonder to most of them as these foods were found to be a good source of energy during their hard-fought journey. This finding might be raw but this might be a kick-start to a magnificent discovery in the future. It is important here to stress once more that, energy food is vital for climbers but it should be tailored to their taste buds if the benefits are to be maximized. Suggestions from the climbers and team doctors were therefore probed to find out the ways to add some value to the dates and ‘kurma’ fruits in fitting the above purpose. The team leader threw out his idea assertively;

“We need something light and easy in the first place. Yeah, dates were good, but if we could create something nice from dates, then definitely we will be more delighted. Maybe something like... emm... kuih, pudding or cookies. The one that we are familiar with... it’s the key.”

The Team Doctor Further Asserted That: *“We all know the benefits of dates at large. I mean, dates are well-known of their benefits...they provide instant energy because of their nutrients. However, we should consider making a simple food from dates ...something that reminds them to the foods commonly taken at home. It sounds simple but, it must go through a proper test... laboratory test before it can be consumed in the real setting (mountain). We are dealing with people who risk their lives, so this is extremely crucial.”*

Looking at the above responds, it is clear that they want a simple food with dates as the main essence to be created without ignoring the taste of it. A proper laboratory test however should be undertaken first before further testing on the effectiveness of the product can be conducted in the actual expedition.

DISCUSSION AND CONCLUSION

Result of the interview session revealed that Malaysian climbers are without doubt of experiencing common phenomena as with other nation's climber during their high altitudes expedition. Extreme condition of high altitudes apparently caused their body weight lose. Hyperventilation or dry and acute mountain sickness also greatly increases climbers water loses and appetite suppression and all these are even worse as they ascending the peak and spent more time at particular settings. These symptoms would have been anticipated by them before the expedition in fact the overall information gathered from the interviewed parallel with other previous studies.

However, despite the indicators on the common symptoms, two very clear pictures emerged in this antecedent investigation study. First, dietary habits of climbers are found to be still the same although they were in different climate regions. In other words, regardless where the climbers came from the palate would not be attractive to other types of food. Therefore, consuming a common eating to live food even in small quantity is necessary for high altitudes climbers despite the presence of an effect of the extreme environment. One of the most prominent researcher in this high altitudes area argued that eating to live represents a food intake necessary to meet the metabolic of the body and maintain the energy [12]. Meaning to say, although losing appetite and body weight are unavoidable, Malaysian climbers' were slightly able to hold it back by consuming their regular taste and buds food in spite in the formed of pudding, cookies, candies or food bar. Secondly, the needs of energy from commonly eaten or improvised food with the local taste are significant particularly in the last phase of expedition. In this sense, after the first attempt in 2004 and despite crystallization, dates or *kurma* and raisin are claimed to be suitable kind of energy food for the Malaysia climbers and most importantly its slightly contribute and maintaining climbers' energy in reaching the top of Everest. With this discovery, our research teams have developed few products from dates, raisin and combination of both, content laboratory testing and in the verge of validating the products among the local climbers at Mount Kinabalu, Sabah and subsequently these products will be provided to 2011 Malaysia Everest expedition team for actual testing in the extreme high altitude environment. Therefore, the investigations of the products are still ongoing and the actual results will be later presented.

REFERENCES

1. West, B.J., 2005. Human responses to extreme altitudes, Society for Integrative and Comparative Biology, 46: 25-34.
2. Singh, N.S., K. Sridharan and W. Silvamurthy, 1999. Human Nutrition at High Altitude, BNF Buletin, 24: 195-205.
3. Westerterp, R.K., 2001. Energy and water balance at high altitude, New in Physiological Sci., 16: 134-137.
4. Bera, J., 2004. Food and Nutrition of the Tibetan Women in India, Anthropologist, 6: 175-180.
5. Edwards, J.S.A., S.P.L. Travis and A.L. Dinmore, 1998. Food and nutritional intake at high altitude, Nutrition & Food Sci., 98: 5-10.
6. Boyer, S.J. and F.D. Blume, 1984. Weight loss and changes in body composition at high altitude, J. Appl. Physiol., 57: 1580-1585.
7. Barnholt, E.K., R.A. Hoffman, B.P. Rock, R.S. Muza and S.C. Fulco, 2005. Endocrine responses to acute and chronic high altitude exposure (4300 m): modulating effects of caloric restriction, Maryland: American Physiological Society.
8. Butterfield, G.E., J. Gates, F. Fleming, G. Brooks, A.R.J. Sutton and A.R.J. Reeves, 1992. Increased energy intake minimizes weight loss in men at high altitude, J. Appl. Physiol., 72: 1741-1744.
9. Pugh, L.G.C.E., 1954. Himalayan rations with special reference to the 1953 expedition to Mount Everest, Proceedings of the Nutrition Society, 13: 60-69.
10. Price, W.L., 1981. Mountain and Man: A study of process and environment, London: University California Press.
11. Thomas, C.J., T.E. Baker-Fulco, N. Jones, D.A. King, B.N. Jezior, Fairbrother and K. Speckman, 1993. Nutritional Needs in Cold and High-Altitude Environments: Applications for Military Personnel in Field Operations, Washington, D.C: The National Academic Press.
12. Westerterp-Plantenga, S.M., 1999. Effects of extreme environment on food intake in human subjects, Proceeding of the Nutrition Society, 58: 791-798.
13. Food safety and Inspection Service (FSIS), 2008. High Altitude Cooking and Food Safety, Washington DC: US Government Printing Office.
14. Marriot, B.M. and S.J. Carlson, 1996. Nutritional needs in cold and in high altitude Environment. Washington, D.C: National Academy Press.
15. Guiland, J.C. and J. Klepping, 1985. Nutritional alterations at high altitude in man. European J. Appl. Physiol., 54: 517-523.

16. Edwards, J.S.A. and D.E. Roberts, 1991. The influence of a calorie supplement on the consumption of the meal ready to eat in a cold environment. *Military Medicine*, 156: 466-471.
17. Dinmore, A.J., J.S.A. Edwards, I.S. Menzies and S.P.L. Travis, 1994. Intestinal carbohydrate absorption and permeability at high altitude (5730m, *J. Appl. Physiol.*, 76: 1903-1907.
18. Archuleta, M., 2005. High altitude cooking, Corporative Extension Service: New Mexico State University.