



An INTERNSHIP REPORT

on

“Assessment of Calorie Consumption among Citizen of Coastal Area of Khulna and Barisal: - a pilot project of icddr,b.”

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LETTER OF ACCEPTANCE

Date:

To

Professor Dr.Md. Bellal Hossain

Department of Nutrition and Food Engineering (NFE)

Daffodil International University

Subject: Submission of Internship Report.

Dear Sir, I would like to take this opportunity to thank you for the guidance and support you have provided me during the course of this report. Without your help, this report would have been impossible to complete.

To prepare the report I collected what I believe to be most related information to make this report as analytical and reliable as possible. I have concentrated my best effort to achieve the objective of the report and hope that my effort will serve the purpose. The practical knowledge and experience I have gathered during preparation report will immeasurably help in my future professional life. I request you to excuse me for any mistake that may occur in the report despite of my best effort.

I would really appreciate it you make wise me with your thoughts and views regarding the report. Also, if you wish to enquire about an aspect of my report, I would gladly answer your queries.

Thank you again for your support and patience.

Marufa Akter

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DEDICATION

This research work is dedicated to my beloved father **Md. Abdul Wahab Bhuiyan** and mother **Monowara Begum** who gave me the support and courage to fulfill this work successfully.

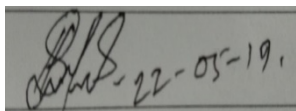
LETTER OF RECOMMENDATION

This is to certify that the project report entitled “Assessment of Calorie Consumption among Citizen of Coastal Area of Khulna and Barisal: - a pilot project of icddr, b.” Submitted for assessment to the examination committee by Marufa Akter bearing ID: 152-34-414 a student of Department of Nutrition and Food Engineering. I am pleased to declared that this report is entirely written by the author and the all the related research work have been conducted by the researcher under my strong supervision and observation .This is a piece of original work and has neither been submitted to nor been published anywhere before for any other purpose.

I strongly recommend the approval of the approval of the report by the report by the authority and by the same token, I also recommend a positive and fare evaluation of the work.

I wish every success in her life.

Yours Sincerely



Dr. Amir Ahmed

Associate Head

Department of Nutrition and Food Engineering

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My gratitude goes to entire NFE Department of Daffodil International University for arranging this research opportunity and facilitating the work throughout.

My warmest thanks to our Coordination Officer, Emran Hossain.

Abstract:

Proper calorie intake is most important, without proper calorie intake a person cannot work properly. In coastal area of Bangladesh Both men and women per capita per day consume 2110.7 kcal whereas men consume 2.97% more kcal daily than women. Grains & Cereals are the first higher source of calorie. While FAO estimates for calorie availability change from a quiet of 1760 Kcal per capita per day for Central Africa to a high of 2825 Kcal per capita per day for Southern Africa, their estimates maintain in a range of 2245 Kcal per capita per day (Eastern Africa) to 2618 Kcal per capita per day for Southern Africa [9]. In Bangladesh at Barisal division people intake 2070.2 kcal per capita per day and at Khulna division people intake 2176.9 kcal per capita per day. According to the HIES preliminary report 2016 per capita per day calorie intake was 2210.4 kcal. In coastal region of Bangladesh at Khulna and Barisal mainly depends on grains and cereals for calorie intake. They also intake calorie from vegetables, pulses, fruits, fish, meats, and milks and eggs items. In general women consume less dietary energy than men, according to their body size, body composition and physical activity level.

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CHAPTER-01

INTRODUCTION

Calories means total mean of energy which required for a person daily intake from regular food items. Mainly calorie is the unite of energy. Each person need to intake a standard amount of calories every day. The total mean of calories a person needs each day varies depending on a number of factors, including the person's age, sex, height, weight, and level of physical activity[1].

Generally women consume less dietary energy then men, according to their body size, body composition and activity [2].

Proper calorie intake is most important, without proper calorie intake a person cannot work properly. The different country's people's calorie intake pattern and requirement are different. In Bangladesh coastal areas people's calorie intake pattern finding and determine are the main interesting field in my works. And every day how much calorie intake in the coastal area's people among their household size and individual.

Fruits
The best fruits for energy are the ones high in fiber, and low in sugar. Dried fruits are also packed with fiber and nutrients.

Vegetables
Leafy greens provide a great deal of nutrients and insoluble fiber. Starchy vegetables have more calories per bite, but are also highly nutritious.

Whole grains
Whole grains provide high amounts of fiber and nutrients; however, they must be eaten in moderation because of their caloric content.

Nuts & seeds
Loaded with protein, they are a complete source of nutrition, prevent metabolic syndrome, and support cardiovascular health.

Legumes
Legumes are great sources of fiber and keep you satisfied for a long time.

Boost Your Energy With Food

www.herbazest.com

1.1 Necessary Calories intake according to gender and age

Gender Age group	Necessary Calorie intake per day for sedentary lifestyle
Children	
Age 5-10	1400 kcal
Men	
Age 20-40	2400 kcal
Age 40-60	2200kcal
Women	
Age 20-25	2000 kcal
Age 25-50	1800 kcal
Age 50-80	1600 kcal

Women with moderate activity levels can add an additional 200 kcal a day, and an extra 400kcal a day for an active lifestyle.

Men for moderate activity levels and can also add an additional 200 calories a day and an extra 400-600 kcal a day for an active lifestyle [10]

1.2 Calorie diet for obese person

For reaching a low-calorie diet (VLCD) programs are the present treatment for chosen obese people. They join vitality admissions of 400-800 kcal/day with therapeutic checking and concentrated way of life training. Commonplace VLCD patients have middle weight lists of 36 kg/m² and have middle ages of 40 years. About 70% are female. Normally related therapeutic issues incorporate hypertension in half, hyper-lipidemia in 41%, and diabetes mellitus or glucose bigotry in 14%. Average weight reduction with VLCD is around 21 kg in 16 wk. Decreases of 8-13% in circulatory strain, 5-15% in serum all out cholesterol, 5-207% in low-thickness lipoprotein-cholesterol, 15-half in triglycerides, and diminishes in blood glucose and glycohemoglobin in diabetic people go with weight reduction. VLCD-related reactions can be overseen restoratively without ending treatment. Way of life training advances long haul weight upkeep of around 56% 2 yr after VLCD treatment. Weight misfortunes utilizing far reaching VLCDs permit decently to very big boned people to accomplish more prominent advantages than other nonsurgical medications and ought to be considered before deciding on careful treatment. [11].

1.3 Coastal area

The coastal biological systems are regions where land and water join to make a situation with a particular structure, assorted variety, and stream of vitality. Human life, job, wellbeing and prosperity are closely connected with nearby biological systems. They incorporate salt bogs, mangroves, wetlands, estuaries, and coves and are home to a wide range of kinds of plants and creatures. In any case, beach front biological systems are additionally exceptionally touchy to changes in the earth, and there is worry that a few regions are currently attempting to keep up their decent variety because of human movement, the presentation of non-local species, and different variables. [12].



1.4 In Bangladesh and coastal area

The absolute region of Bangladesh is 147, 570 km². The beach front region covers about 20% of the nation and more than 30% of the net cultivable territory. It stretches out inside up to km from the coast. Out of 2.85 million hectares of the waterfront and seaward regions about 0.83 million hectares are arable grounds, which spread over 30% of the absolute cultivable terrains of Bangladesh. A piece of the waterfront zone, the Sundarbans, is a hold characteristic mangrove woodland covering around 4,500 km². The rest of the piece of the waterfront zone is utilized in agribusiness. The cultivable regions in beach front regions are influenced with differing degrees of soil saltiness. The beach front and seaward region of Bangladesh incorporates tidal, estuaries and stream floodplains in the south along the Bay of Bengal. Rural land use in these regions is poor, which is generally half of the nation's average [13].

Healthy, High-Calorie Foods



Pistachios - 1 Tbsp. 120 calories



Egg - 70 Calories



Banana
100 calories



Wheat Germ - 1/4 c.
120 calories

♥alkinsondrive.tumblr.com♥



sweet potato
162 calories



Dark Chocolate - 100 g
501 calories



Peanut Butter - 1 Tbsp.
192 Calories

Olive oil 1 Tbsp.
120 Calories



Study Objective

- To gain a complete know how to conduct a study using secondary data from conceptualisation to analysis an interpretation of data.
- To get a hands on training Stata 14 version.

CHAPTER-02

Background

Background:

In the past time there are many article & journal was published in globally or international & nationally. Suppose In 1997 one article are published of cultural factors, caloric intake and micronutrient sufficiency in rural Nepal households. In South Asia, gender-based differentials to the current economic contribution of adult males versus adult females and the realized future economic powerful of the male child versus the female child [3]. Average per capita daily calorie supply in developing countries increased from 2140 in 1970 to 2716 in 1996–1998,[4]. According to the household size calorie intake is different.

Average household size was different for different division that's are found from different years reports of HIES. Among the several divisions, in 2016 the highest household size was 4.94 that's reported from Sylhet division pursued by Chittagong division at 4.47. The lowest household size reported from Khulna division as 3.74 approached by Rajshahi as 3.76 and Mymensingh 3.85 [5].

My study area are Barisal and Khulna division and several districts of under Barisal and Khulna. The study are represents that Khulna division's peoples mean calorie intake are higher than Barisal division.

By the help of stata14 I analysed the data of coastal areas people's mean calorie intake according to different food groups, division, district, gender, social ecological system etc.

This study was a pilot project of icddr,b I done this work by the secondary data analysis process. The icddr, b was set up in Dhaka in 1960s as the South-East Asia Treaty Organization (SEATO) Cholera Research Laboratory.

The Cholera Research Laboratory (CRL) before long built up a global notoriety in diarrhoeal illness examine. Among its eminent early accomplishments was a key job in the advancement, testing and execution of oral rehydration arrangement (ORS) – a treatment evaluated to have spared a huge number of lives around the world.

Within the 1960s, the CRL additionally settled a huge scale wellbeing and statistic reconnaissance site at Matlab – presently the longest-running such site in the worldwide south and a motivation for some comparable destinations around the world.

In 1962, the CRL set up the Dhaka Hospital, still kept running by icddr,b, to meet the pressing need to treat patients, especially youthful kids, with extreme diarrhoeal sickness. The Dhaka Hospital has formed into a broadly significant treatment focus and gives a

foundation to broadprogram of clinical research. Clinical administrations were additionally presented at Matlabhospital.



In 1978, the CRL got new driving force and another name – the International Center for Diarrhoeal Disease Research, Bangladesh. As of late, we have been referred to just as icddr,b. [14].

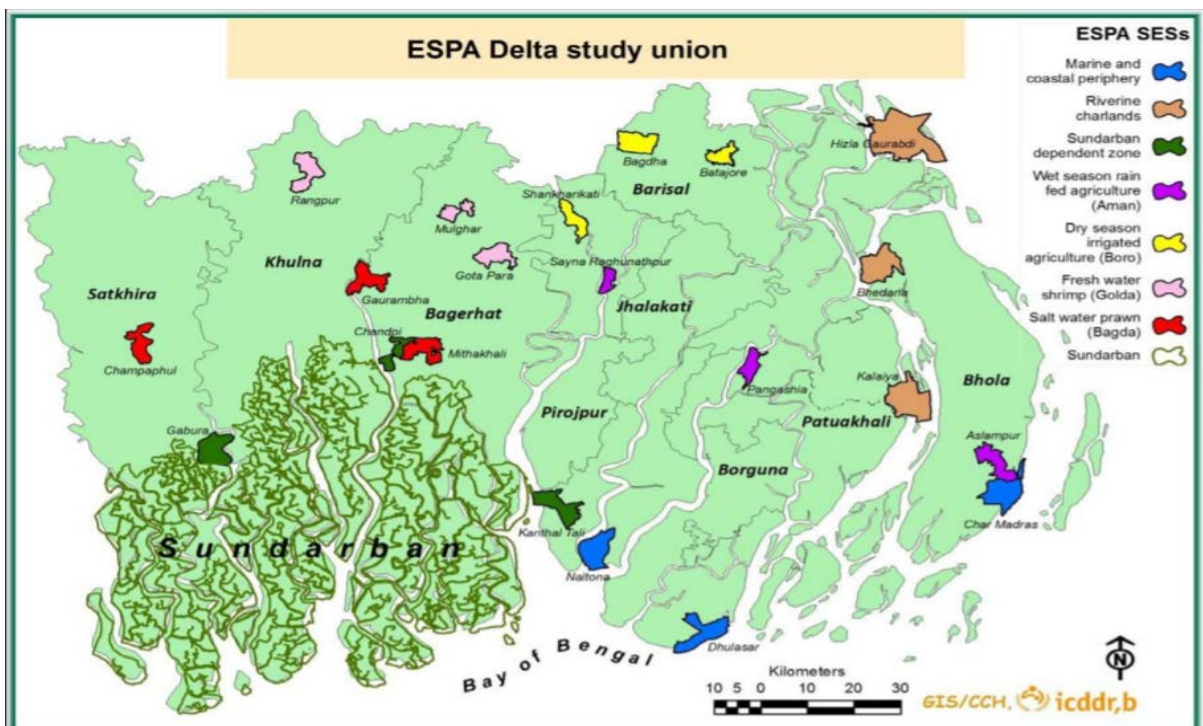
CHAPTER-03

Methodology

Methodology

The study was completed under the appearance of ‘Mensuration Health, Livelihoods, Ecosystem Services and PovertyPalliation in Populous Deltas (ESPA Deltas)’ project. ESPA Deltas was a large multi-disciplinary project, which aimed to understand the link between environmental change, ecosystem works, human welfare (including health), poverty and development within the world’s largest delta – the Ganges–Brahmaputra–Meghna (GBM) Delta. The Bengal delta covers 19 districts and 25.7% of the population of Bangladesh (BBS, 2011) with diversified natural resources, including critical ecosystems such as the Sundarban mangrove forest, fisheries, prawn farms, agriculture, and savings of minerals and salt, with export promotion sites, shelters , airports, seaports, tourism, and other industries-supporting the livelihoods of more than 37 million people. Poverty in the coastal area is distinguished with high vulnerabilities in terms of food insecurity, income, water and health [6]. The ESPA Deltas study area covers 21 unions from 9 coastal districts covering south-central to south-west regions of the Bengal delta in Bangladesh. These unions associate to 7 Socio-Ecological Systems, SES [7]and gather to wet season rice only (Aman), dry season irrigated rice cultivation (Boro), saltwater prawn aquaculture (Bagda), freshwater prawn aquaculture (Golda), Riverine char lands, Sundarban dependent zone and coastal marine periphery (Figure 1).

Figure 1: ESPA deltas study area map.



It was hypothesized that, prevalent land use at a special geographical location (i.e. SES) has an effect on the quality of ecosystem services (ES) and on health effects of the population. A lengthwise survey was driven within the ESPA Deltas project in the South West to South Interior coastal zones of Bangladesh [7]. The ideal Figure 1: ESPA deltas study area map. In ESPA deltas study, 4 Social-ecological Systems (SES) were matched with major land-use types: Aman, Boro, Bagda and Golda SESs. Unions declining in these SES were defined by greater than 80% land coverage of each of these land uses, adjusting for mudflats, river canals, sand, rural and urban habitation, water remains and water logged land areas. 3 SES are not directly identifiable by specific land use type, but local environmental characteristics. Sundarban dependent SES includes all unions adjacent with the Sundarban. Marine unions are all sea frontal unions and Char unions are defined as any union that has the presence of riverine chore [7].

3.1 Participants and Demographic characteristics

This study utilizes secondary data obtained from previous surveys conducted at various coastal areas of Bangladesh as like as Khulna and Barisal. A standardized questionnaire was used to collect information related to demographic characteristics such as age, gender, place of residence, marital status, and average household income, household number, household size, Physical activity was also recorded.

3.2 Diet assessment

Food consumption pattern was assessed with the help of a quantitative food frequency questionnaire which included food groups such as cereals, vegetables, fruits, meat, fish, pulses, milk based dishes and beverages. The consumption frequency of each food group was estimated with responses such as daily, weekly, monthly and yearly along with number of times in each case. Intakes of food were converted to g/day and the portion size obtained was further used for nutrient calculation. 24 hour recall survey was also utilized to include any food item that was missed in the questionnaire. Calorie calculation from raw and cooked foods was based on the nutritive values of Bangladeshi foods. All the food items consumed by each participant were listed in the Food Composition Table for Bangladesh [17]. The amount of calorie was calculated with the following formula Amount of calorie = (portion of food consumed*amount of calorie present per 100 g of food)/ 100.

3.3 Statistical analysis

Statistical analyses were completed by the use of Stata14 version which is statistical data analysis software. Continuous variables are supplied as means to check differences in continuous variables.

CHAPTER-04

Results and Discussion

4.1 Results:

Table 1 represents the total and gender specific daily mean calorie intake and 95% Conf. Interval for different food groups. Both men and women per capita daily consume average 2110.7 kcal whereas men consume 2.97% more kcal daily than women. Grains & Cereals are the first higher source of calorie. Among total Calorie both men and women are consume most of the Calorie from Grains & cereals item. Almost 2/3 of Calorie intake from grains & cereals. Men and women both of are average consume 1660.4 kcal daily from grains & cereals whereas men consume daily 3.44% more kcal than women from GC. Vegetables are the second higher source of calorie. Both men and women are per capita daily average consume 154.9 kcal from vegetables, whereas man consume 0.97% more kcal than women. These table are show that female are some of more calorie intake than male from Fruits & meat items, but females total calorie intake are less than male. And first most less source of calorie are consume from other food like salt which contain 0 calorie or not. The second less source of calorie are milk and egg items. Both men and women per capita daily average consume 27.9 kcal whereas men consume 28.2 kcal daily and women consume 27.7 kcal. [17]

Table 1: Daily Total Calorie intake from different food groups

Food group	Total Mean Calorie intake (95%CI) Daily per capita (kcal)	Men Mean Calorie intake (95%CI) Daily per capita (kcal)	Women Mean Calorie intake (95%CI) Daily per capita (kcal)
All food groups	2110.7 (2090.9, 2130.4)	2142.5(2114.2, 2170.8)	2080.9 (2053.3, 2108.4)
Grains & Cereals	1660.4(1643.8, 1676.9)	1689.4(1665.7, 1713.03)	1633.3(1610.2, 1656.4)
Pulse	72.9(70.5, 75.3)	74.5(71.03, 78.02)	71.3(67.98, 74.6)
Vegetables	154.9(152.5, 157.4)	155.7(152.2, 159.2)	154.2(150.7, 157.6)
Fruits	53.4(50.9, 55.8)	52.8(49.2, 56.3)	53.9(50.6, 57.2)
Meat	39.95(38.003, 41.9)	39.8(36.8,42.8)	40.1(37.6,42.7)

Fish	101.3(98.97, 103.6)	102.2(98.9,105.5)	100.4(97.2,103.7)
Milk and Egg	27.9(26.7, 29.1)	28.2(26.4,29.98)	27.7(26.1,29.3)
Other Food	0(0,0)	0(0,0)	0(0,0)

Table 2 represents the daily per capitamean Calorie intake according to the Division & District. We take data from only two division, Barisal & Khulna. These division are converts into several districts. The peoplesof under Khulna division are per capita daily average intake 5.2% more kcal than Barisal division’s peoples. On the other hand when we compare among all over districts of Barisal division we can found that the Bola districts peoples are intake more and Patuakhali districts people are consume less kcal than other districts of Barisal division. And in Khulna division Khulna districts people are consume 6.3% more kcal and Bagerhat districts people are consume 6.69%less kcal than Satkhira.

Table 2: Division and District vs Calorie intake

Division & District	Mean Calorie intake (95%CI) Daily per capita (kcal)
Barisal	2070.2(2045.8, 2094.7)
Barisal	2125.8(2076.3, 2175.4)
Patuakhali	1991.1(1938.6, 2043.5)
Pirojpur	2043.5(1936.7, 2066.9)
Bhola	2140.6(2091.7, 2189.5)
Barguna	2066.3(2003.99, 2128.6)
Khulna	2176.9 (2143.7, 2209.98)
Khulna	2388.9 (2280.1, 2497.7)
Bagerhat	2106.4 (2066.2, 2146.7)
Satkhira	2247.3(2182.1, 2311.96)

Different social ecological system's people's food habit is different, so calorie consumption is varied for different zones. In table 3 represents that the people who are live in Golda social-ecological systems they intake 2193.99kcal Calorie that is more than all other six social ecological systems .And Marine and Coastal Periphery areas people are consume 2030.7 kcal energy less than all other social ecological systems.

Table 3: Social-ecological Systems vs Calorie intake

Social-ecological Systems	Mean Calorie intake (95%CI) Daily per capita (kcal)
Riverine Zone	2070.4(2016.9, 2123.8)
Sundarban Dependent	2165.5(2114.7, 2216.4)
Marine and Coastal Periphery	2030.7(1981.9, 2079.5)
Boro	2047.3(1994.2, 2100.3)
Aman	2080.8(2031.7, 2129.98)
Bagda	2187.8(2138.2, 2237.5)
Golda	2193.99(2134.4, 2253.6)

According to the study we can show that calorie consumption is varied for economic condition. Table 3 shows that middle earning family are intake high kcal than poor and less poor. The poorest are consume lowest calorie and the least poor are consume highest calorie respectively 1989.6 kcal and 2211.8kcal.

Table 3: Wealth Quintiles vs. Calorie intake

Wealth Quintiles	Mean Calorie intake (95%CI) Daily per capita (kcal)
Poorest	1989.6(1946.7, 2032.4)
Poor	2088.1(2046.8, 2129.3)
Middle	2135.7(2093.1,2178.3)
Less Poor	2128.7(2084.01, 2173.3)
Least Poor	2211.8(2163.5,2260.1)

4.2 Discussion

Per capita per day calorie intake in different survey years have been presented in HIES preliminary report 2016, with urban-rural breakdown. The overall calorie intake per capita per day had reduced to 2210.4 kcal in 2016 from 2308.1 kcal in 2010, (which difference was 4.23%) [5]. that was a real decrease of rice consumption in 2016 compared to 2010. Observing the coastal areas data we see that per day per capita mean calorie intake 2110.7 kcal in 2019 that also reduce from 2210.4 kcal in 2016. But here rice consumption rate is 1660.4 kcal per capita per day that is increase from 1550.92 kcal in 2016 and decrease from 1768.04kcal in 2019 (Table 1). Consumption of food items is highly dependent on the availability of food, its price level and also food habits. Seasonal variations in prices of food items, especially in case of cereals, fruits and vegetables are distinct. Therefore, increase or decrease of quantity consumed may be considered in the light of these factors. In this current study the calorie consumption is different among gender, different division and district, social ecological system and Wealth Quintiles. Men consume high kcal then women and rich people consume more kcal than poor people. In general, men have more muscle mass than women, so they needs more calories than women [8]. In this reason men can consume more calorie then women. And rich people's purchasing power is high so they can consume more calorie then poor person.

In general, a moderately active 19- to 30-year-old woman needs 2,000 to 2,200 calories a day, whereas a man in the same category needs 2,600 to 2,800. A 31- to 50-year-old woman at the same activity level needs 2,000 calories and a man needs 2,400 to 2,600 calories a day. A woman older than 50 needs 1,800 and a man older than 50 needs 2,200 to 2,400 calories [8]. In coastal areas men intake per day per capita 2142.5 kcal and women intake per day per capita 2080.9 kcal (Table 1). So calorie intake in coastal areas people should increase among both men and women.

Dietary studies among 130 examination families in June August 1978 demonstrated that for every capita male sustenance consumption reliably surpassed that of females in all age gatherings. In general, guys found the middle value of 1,927 calories for each capita in contrast with 1,599 calories for females.

Male caloric utilization surpassed female utilization by a normal of 16 percent among youngsters under 5 years. This abundance was to some degree more than 11 percent among youths 5-14 years, and 29 percent for the grown-up childbearing age gathering, 15-44 years.

The higher male than female caloric utilization was most set apart among those matured 45 years and more seasoned, where male admission surpassed female admission by 61 percent. [15]

The real types of disease among children's in developing nations are protein-calorie hunger promotion the basic youth contaminations, for example, looseness of the bowels, measles, respiratory infections, and diseases of the skin, eyes, and ears.

In view of the records of sustenance buys in the 2002-2003 HBS, utilization of the grown-up proportionate scale importantly affected Brazil's family calorie accessibility gauges. The proportion between grown-up proportional and per capita calorie accessibility was constantly more prominent than 1, demonstrating underestimation of calorie accessibility when family unit piece is ignored. In spite of the fact that this impact was identified in all the re-enactment situations, it was especially significant in low-salary and rustic family units. [16]

The examination utilized information from the 2002-2003 Brazilian Household Budget Survey. The calorie prerequisite for a reference grown-up individual depended on the mean necessities for grown-up males and females (2,550kcal/day).

In our current study represent that Division and district wise people's calorie consumption are different we found that Barisal and Khulna division's people daily intake Kcal 2070.2 and 2176.9 respectively. The districts people of Barisal, Patuakhali, Pirojpur, Bhola, Barguna, Khulna, Bagerhat and Satkhira per capita per day intake 2125.8, 1991.1, 2043.5, 2140.6, 2066.3, 2176.9, 2388.9, 2106.4, and 2247.3 Kcal respectively.

In the current study also represent that different Social-ecological Systems peoples mean calorie intake are different here Riverine Zone, Sundarban Dependent, Marine and Coastal Periphery, Boro, Aman, Bagda, Golda regions per capita per day calorie intake are respectively 2070.4, 2165.5, 2030.7, 2047.3, 2080.8, 2187.8, 2193.99 Kcal.

Whereas the recommended mean calorie intake for adult men 2000 to 3000 calories and women's are 1600 to 2400 calories per day, here our coastal areas men intake 2142.5 calories per day and women intake 2080.9 calories per day. So coastal areas people should to concern about their mean calorie intake for healthy living.

Conclusion

This study found that people in coastal region of Bangladesh at Khulna and Barisal mainly depend on grains and cereals for calorie intake (Table1). In Khulna districts mean calorie intake of studied sample is 2388.9 kcal which is found satisfactory according to the standard, but at Patuakhali districts mean calorie intake is 1991.1kcal which is below average then 2210.4 kcal in 2016. In comparison with the HLES preliminary report [5], it is recommended to increase calorie consumption among Patuakhali and other districts of coastal region. And poor people need enough food to consume sufficient energy balance. Poor people also need to increase their per capita daily calorie intake. Findings show that people of Barisal division intake more calorie then Khulna division. And study finding also shows that men consume more calorie then women.

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