Fat and Sodium Content of Kid's Meals Offered in Some Fast Food Chains in Jeddah, KSA

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ABSTRACT

Obesity among children is becoming the largest public health concern. Fast food kid's meals, which are the top selling fast food item sold, have high amounts of fat and salt (sodium) content. This study was conducted to assess fat and sodium content in kid's meals offered in some popular local fast food chains in Jeddah city then compare the results with one-third of the FDA Recommended Daily Value (DV). Some local fast food chains were selected; Kudu, Herfy, AlTazaj, and AlBaik. 33 kid's meals were purchased from these chains and analyzed for their fat and sodium content. The results showed that the average fat was significantly ($p \leq 0.05$) high in Kudu, Herfy, and AlBaik chains, but it was not significantly high in AlTazaj chains compared to the DV. Additionally, the average sodium content was significantly ($p \leq 0.05$) high in AlBaik chains but not significantly high in AlTazaj chains, while in Kudu and Herfy chains sodium content was significantly ($p \leq 0.05$) low compared to the DV. Furthermore, the study found that the kid's meals offered in popular local fast food chains are an unhealthy option and not compatible with nutritional recommendations for children. This kind of food is responsible for obesity, hypertension, dyslipidemia, heart disease and diabetes. Therefore, developing a nutrition education program is necessary to increase awareness and control the consumption of such food by children.

Key Words: Fast food, kid's meals, fat, sodium, recommended daily value (DV).

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INTRODUCTION

Proper nutrition is very important during childhood, because it is directly linked to all aspects of child growth, development and helps promote a better quality of life.The modern environment has an effect on the way children eat. The busy schedules of families today and the increasing popularity of fast food restaurant options makes children, like their
elders, eat out now more than ever before. On average 25% of their daily calories are consumed at fast-food restaurants [1]. In recent years, Saudi Arabia has seen several changes in the food choices and nutritional habits of its population, from the traditional Arab style to a more western style. This "nutritional transition" makes fast food a prominent feature in the Saudi diet [2]. Industry data indicates that the fast food market in Saudi Arabia is the largest market in the Gulf region, and in 2015, the gross sales reached $4.5 billion. This growth can be attributed to growing demand from the population [3]. Fast food demand has grown into a dietary pattern among children. Children make up the majority of fast food consumers. Fast food companies deliberately target children at an early age to encourage the regular consumption of fast food and to create lifelong loyalty to these foods [4].

Kid's meals are fast food meals that are boxed or bagged, often with a toy, and marketed to children [5]. These meals are marketed to children through the use of animation, cartoon characters, and attractive collectable toys [6,7]. In the last 30 years, the consumption of fast

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food among children has increased five-fold and the proportion of foods that children consumed from fast food restaurants increased by nearly 300% [8,9]. In 2011–2012, 34.3% of all children and adolescents aged 2-19 consumed fast food on any given day [10]. Several studies have shown that away-from-home foods contribute 30-42% of energy requirements and are typically less nutrient dense than foods served at home [8 ,11-13]. There is a concern over the high rates of fast food consumption among children because foods consumed away from home tend to contain more calories, fats, cholesterol, sugars, and sodium, and fewer portions of milk, fruit, and vegetables than foods that are consumed at home [8,11-15].

Children who frequently consume fast food have poor nutritional quality and are more susceptible to obesity compared to those who are less frequent consumers [11,16].Although many factors contribute to childhood obesity, research suggests that eating out is an important factor [17]. The expert committee convened by the American Medical Association (AMA) concluded that there was consistent evidence that eating out at restaurants, particularly fast food restaurants, is a risk factor for obesity and should be limited [18]. Children who are overweight and obese consume more fast foods than children who are not [16]. Childhood obesity has become a serious public health problem because obese children tend to become obese adults, putting them at a greater risk for heart disease, hypertension, diabetes, and certain types of cancer [19,20]. Furthermore, it seems that as children age, fast food consumption increases [9].

According to many studies, kid's meals that are offered in fast food restaurants do not meet the nutritional recommendations for children [21]. When their contents were analyzed against international benchmarks, they were deemed unhealthy for containing high levels of saturated fat, sodium, and sugar and low levels of vitamins and minerals [22]. In 2008, a study of the top 25 chain restaurants found that 93% of kid's meals are high in calories, 45% are high in saturated fat, and 86% are high in sodium [23,24]. The Center for Science in Public Interest (CSPI) reported that between 2008 and 2012, the percentage of kid's meals meeting nutrition standards increased from 1% to just 3%. Meaning, 97% of restaurant meals are still unhealthy and do not meet nutrition standards[25]. Another study reported that only 12% of 3,039 kid's meal combinations met nutritional criteria for preschoolers, 15% met nutritional criteria for older children, and of the 2,900 regular menu items examined, only 17% qualified as healthy choices for teens [26]. In 2012, a study assessed the nutrient quality of fast food kid's meals in New York City using the National School Lunch Program (NSLP) and the Dietary Guidelines for Americans 2010 nutrition standards. Of 762 kid's meals, no meal combination met all 7 NSLP criteria and only 3.8% of the meals met 6 of the NSLP criteria [27].

Two trends motivate the need for an evaluation of the nutrient quality of fast food kid's meals: the increased prevalence of childhood obesity and the increasing proportion of daily food energy consumed away from home [28]. Therefore, the main objective of this study was to assess total fat and sodium content of kid's meals offered in local fast food chains and compare them to one-third of the DV assuming that one meal is equivalent to one-third of the recommended daily intake.

METHODOLOGY

Selection of samples

Kid's meals were chosen as follows: three meals from Kudu and Herfy chains (chicken burger, beef burger, and nuggets), three meals from AlTazaj chains (chicken burger, chicken satay, and nuggets) and two meals from AlBaik chains (chicken burger and nuggets). Each meal was purchased from three different branches and analyzed three times, then the average was calculated (a total of 33 meals were analyzed). Each meal includes the main item and a side (fries).

Preparation of samples

The meals were purchased and taken to the laboratory to be analyzed. First, they were individually weighed and homogenized using a food processor, then they were labeled and kept in the laboratory freezer for chemical analysis.

Fat analysis

First, the moisture content was determined for each meal usingtheAOAC Official Method 934.01. After that, samples from each meal were analyzed for fat content by using the Soxhlet apparatus according to AOAC Official Method 991.36. The assay combines two specific steps: in the 1st step the sample was weighed and dried. In the 2nd step, a solvent was added to the dried sample with an extraction unit in order to extract the fat. After extraction, the fat content in each sample was determined by using the following equations:

$$\% \text{ Fat} = \frac{(\text{wt. of extraction cup after extraction} - \text{wt. of extraction cup before extraction}) \text{ x}100}{\text{wt. of test portion}}$$

$$\text{Amount of fat in the meal} = \frac{\% \text{ fat x } (100 - \% \text{ moisture})}{100} \text{ X} \frac{\text{net wt. of sample (g)}}{100}$$

Sodium analysis

Sodium content was determined by using microwave digestion followed by the Inductively Coupled Plasma-Atomic Emission Spectroscopy technique (ICP-AES). First, the samples were digested and converted into liquids by acid digestion with HNO3 and H2O2 in a closed vessel device using the multi-wave 3000 microwave digestion system. The digestion program consisted of 30 min of heating and 15 min of cooling. All the samples were completely dissolved, resulting in clear solutions that were diluted to a final volume of 50 ml with

deionized water. Then, the ICP- AES technique was used for determining the mineral content in each sample.

Statistical analysis

The statistical analysis of data was performed using SPSS version 20. Variables were represented by mean values. Single sample t-tests were used to compare the analysis values to one-third of DV, confidence interval was 95%.

RESULTS

Table (1) shows the content of fat in kid's meals. The table illustrates that the fat content in chicken burger meals from Kudu, Herfy and AlTazaj were close together (27, 27.19 and 28.52g, respectively) and lower than the fat in AlBaik meal (32.3g). Also, fat content in the beef burger meal from Kudu (30.12g) was higher than the fat in the Herfy meal (25.43g). Comparing all kid's meals, the lowest fat content was in the chicken satay meal from AlTazaj (14.28g), and the highest fat content was in the nugget meal from AlBaik (34.13g). One third of the DV for fat is 21.7g. Table (2) shows that all meals exceeded one-third of the DV for fat. The average fat content in Kudu, Herfy and AlBaik was significantly high ($p \leq 0.05$), while the average fat content in AlTazaj was not significantly high compared to the DV. As shown in Figure (1) the highest average fat content was found in AlBaik chains and the lowest was in AlTazaj chains.

Table (1): Fat content in kids' meals inin some popular local fast food chains (g)

Kids' meals	Kudu	Herfy	AlTazaj	AlBaik
Chicken burger	27.0 ±0.40	27.19±0.36	28.46±0.38	32.30±0.78
Beef burger	30.12±0.96	25.43±0.15	-----	-----
Chicken satay	-----	-----	14.28±0.06	-----
Nuggets	33.53±1.39	28.46±0.21	27.50±0.41	34.14±0.22

Each value represents the mean of 3 replications and expressed as mean ± SD

Table (2): Average of fat versus one-third of DV

Fast foods chains	Fat (g)	DV (g)	P-value
Kudu	30.22 ± 3.27	21.7	0.046*
Herfy	27.03 ± 1.52		0.026*
AlTazaj	23.43 ± 7.94		0.742
AlBaik	33.35 ± 1.29		0 .041*

Each value represents the mean of 3 replications and expressed as mean ± SD
* Significant compare with one third of DV at ($p \leq 0.05$).

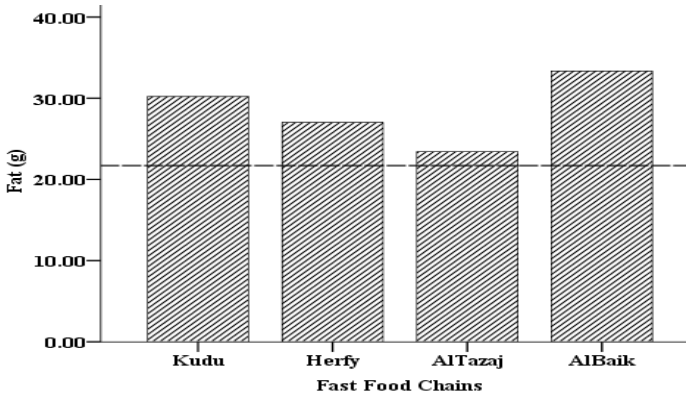

Figure (1): Average values of fat versus the one-third of DV (21.7 g)

Table (3) shows the content of sodium in kid's meals. Sodium content in the chicken burger meals from Kudu and Herfy chains were similar (687.57 and 657.13mg) and lower than the amount of sodium found in AlTazaj and AlBaik meals (1137.48 and 1398.38 mg, respectively). Also, the sodium content in beef burger meals was low. The lowest content of sodium was found in the chicken satay meal from AlTazaj (583.51 mg). Sodium content in the nugget meals was low in Kudu and Herfy meals (712.17 and 684.12 mg, respectively), slightly high in AlTazaj meals (820.79 mg), and highest in AlBaik meals (1482.26 mg). Table (4) and Figure (2) show the averages of sodium compared with the DV. One third of the DV for sodium is 800 mg. The average of amount of sodium in Kudu and Herfy was significantly lower than the DV ($p \leq 0.05$). The average amount of sodium in AlBaik was significantly high ($p \leq 0.05$), while the average amount of sodium in AlTazaj was not significantly high compared to the DV, the highest average amount of sodium was found in AlBaik chains and the lowest was in Herfy chains.

Table (3): Sodium content in kids' meals inin some popular local fast food chains (mg)

Kids' meals	Kudu	Herfy	AlTazaj	AlBaik
Chicken Burger	687.57± 0.71	657.13±0.32	1137.48±0.23	1398.38±0.51
Beef Burger	721.74±0.59	590.83±0.95	-----	-----
Chicken Satay	-----	-----	583.51±0.16	-----
Nuggets	712.17±1.17	684.12±0.29	820.79±0.42	1482.26±0.51

Each value represents the mean of 3 replications and expressed as mean ± SD

Table (4):Average of sodium versus one-third of DV

Fast foods chains	Sodium (mg)	DV (mg)	P-value
Kudu	707.16 ± 1.76	800	0.012*
Herfy	644.03 ± 4.8		0.030*
AlTazaj	847.26 ± 2.78		0.796
AlBaik	1440.32 ± 3.6		0 .042*

Each value represents the mean of 3 replications and expressed as mean ± SD
* Significant compare with one third of DV at (p ≤0 .05).

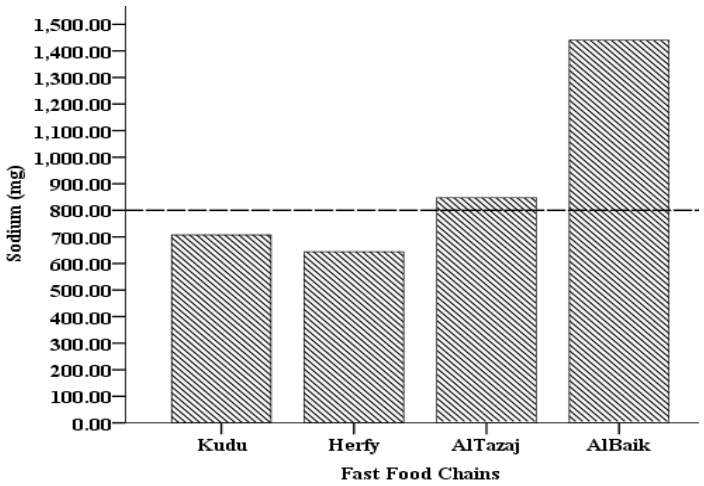

Figure (2): Average values of sodium versus the one-third of DV (800 mg)

DISCUSSION

Lunch or dinner meals should only provide 30% of daily energy requirements for children [29]. In the current study, the average fat content exceeded 30% of the DV. Considering that global estimates of childhood overweight and obesity are currently at 200 million [30] and children consume large amounts of fast food and other non-core ''extra'' foods (such as fried potato products and soft drinks, which are common components in kid's fast food meals) [11 & 31-33], the diet quality of kid's meals offered contributes significantly to the nutritional status of children.There is growing controversy over the link between high-fat fast food and childhood obesity. One in three youths are now overweight, and children who live near fast food restaurants are more likely to be obese [34].

It is reported that 65% of kid's meals exceeded guidelines for total fat [24], and in another study 72% of meals exceeded the guideline for total fat for the past 5-6 years, 57% exceeded the guideline for the past 7-10 years, and 81% of meals exceeded the guideline for fat as a percentage of total food energy [35]. Another study evaluated popular food items in kid's meals at fast food restaurants and reported that, kid's meals were significantly higher in fat than one-third of the recommended DV [36]. In addition, high fat and high cholesterol foods like those found in kid's meals are causing overweight children's arteries to resemble those of 45-year-old adults [37].

Diets high in fat have been linked to increased risk of certain cancers. Moreover, overweight girls show signs of puberty at a younger age, which can increase the risk of breast cancer [38]. Specifically, diets high in fried foods, meat, and vegetable oils cause an increase in the production of estrogen that increases cancer risk in the breast and other organs sensitive to sex hormones [39]. In 2010, the Centers for Disease Control and Prevention (CDC) found that 20% of adolescents ages 12 to 19 have at least one abnormal lipid level (LDL and HDL cholesterol, or triglycerides), and one in five teens has an abnormal cholesterol level [39], a risk factor for heart disease [40].

Several studies evaluated the mineral content in kid's meals that are offered in fast food restaurants and showed that these meals are poor in mineral content with the exception of sodium [41]. The majority of kid's meals have more sodium than children should consume and are harmful to them. The obtained results were in agreement

with other studies that reported that more than 50% of kid's meals exceeded the recommendation for sodium [24, 36].

An evaluation of kid's meals showed that 90% exceeded 30% of the recommendation for sodium for 4 to 8 years old, and 63% of meals exceeded the recommended amount for 13 years old [42]. Excessive sodium is a common reason for the serious detrimental effects of fast food meals. 77% of dietary sodium is derived from processed foods and restaurant foods [43]. Taste preferences for salty foods may be established early in life, so the less sodium children consume, the less they want [44]. The high levels of sodium commonly found in kid's meals can contribute to high blood pressure and calcium loss from bones [39], and can also increase the risk of cardiovascular disease and kidney problems [45-57]. It is reported that between 1999 and 2008, the prevalence of elevated blood pressure for boys and girls aged 8-17 years was estimated to be 19.2% and 12.6%, respectively [48]. Blood pressure during childhood has a significant association with blood pressure during adulthood, meaning that children with increased blood pressure are at high risk for hypertension and its related morbidity as adults [49].

For children eating out, making healthy food choices can be challenging. Although the majority of kid's meals are unhealthy, researchers believe that the meals can be designed to be both highly palatable and meet a basic level of nutrient quality [24]. Therefore, it is recommended that fast food companies should develop and market more nutritious kid's meal options and also for parents to choose healthier meals for their children. Furthermore, nutrition labeling on fast food menus has the potential to assist parents in choosing healthier meals for their children. This strategy has been trialed overseas, where studies found that consumers were more likely to choose meals that were lower in calories, fat and sodium if menu labeling was provided at the point of sale. It suggested that instead of giving children toys for eating unhealthy meals, kid's meals should be reworked to only offer toys accompanying meals that are healthy and low in fat.

CONCLUSION

It can be concluded that kid's meals that are offered in local fast food restaurants are unhealthy and high in fat and sodium. Therefore, by creating healthier menu items and marketing them more effectively, fast food restaurants would attract lifelong customers who will also live longer, healthier lives.

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