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The art of grocery shopping on a food stamp budget: factors influencing the food choices of low-income women as they try to make ends meet

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Abstract

Objective: Amidst a hunger–obesity paradox, the purpose of the present study was to examine the grocery shopping behaviour and food stamp usage of low-income women with children to identify factors influencing their food choices on a limited budget.
Design: Focus groups, which included questions based on Social Cognitive Theory constructs, examined food choice in the context of personal, behavioural and environmental factors. A quantitative grocery shopping activity required participants to prioritize food purchases from a 177-item list on a budget of $US 50 for a one-week period, an amount chosen based on the average household food stamp allotment in 2005.
Subjects: Ninety-two low-income women, with at least one child aged 9–13 years in their household, residing in the Twin Cities, Minnesota, USA.
Results: Participants' mean age was 37 years, and 76 % were overweight or obese (BMI $\geq$ 25·0 kg/m^2). Key findings suggest that their food choices and grocery shopping behaviour were shaped by not only individual and family preferences, but also their economic and environmental situation. Transportation and store accessibility were major determinants of shopping frequency, and they used various strategies to make their food dollars stretch (e.g. shopping based on prices, in-store specials). Generally, meat was the most important food group for purchase and consumption, according to both the qualitative and quantitative data.
Conclusions: Efforts to improve food budgeting skills, increase nutrition knowledge, and develop meal preparation strategies involving less meat and more fruits and vegetables, could be valuable in helping low-income families nutritionally make the best use of their food dollars.

Keywords
Low income
Grocery shopping
Food choice
Hunger–obesity paradox

Health professionals have recently been alerted to a phenomenon afflicting much of the low-income population in the USA: obesity in the face of hunger, or the hunger–obesity paradox[1]. Whereas one might associate chronic hunger with decreased food intake and low BMI, the relationship between food sufficiency and weight among low-income individuals is less clear. For example, being poor as a child is associated with being overweight or obese as an adult, and research has linked food deprivation in childhood with emotional attachment to food later in life[2]. According to Ozier *et al.*[3], individuals who eat for emotional and stress-related reasons are more likely to be overweight or obese.

From an environmental perspective, however, food pricing and availability may present a more overt relationship between hunger and obesity. Whereas food stamps are the first line of defence in the fight against hunger in the USA by increasing the purchasing power of low-income individuals and families, participation in the Food Stamp Program (FSP) has been associated with poor dietary intake, overweight and obesity[4]. Monsivais and Drewnowski[5] found high-energy-density foods such as cookies to cost significantly less per 4184 kJ (1000 kcal) and to be resistant to price inflation in comparison to low-energy-density, nutritious foods such as fresh fruits. Moreover, the availability and selection of nutritious foods tends to be poorer in disadvantaged neighbourhoods[6–8], thus limiting the ability of low-income families to make healthful food choices. Research suggests that the food stamp cycle, known as a feast at the beginning of the month followed by a famine once resources run out, may alter metabolism and promote weight gain[4]. Because food stamp recipients choose their purchases from a wide range of allowable foods, the

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current challenge is to change consumer preferences[9]. To move in this direction, the present study examined grocery shopping behaviour and factors influencing food choice and food stamp usage among low-income women with children in their household, using both qualitative and quantitative methods of data collection.

Experimental methods

Two researchers trained in focus group methodology conducted fourteen focus groups in the Twin Cities metropolitan area. Mothers or female guardians with at least one child aged 9 to 13 years in the household were eligible to participate, and they were recruited by posting flyers. Approximately one-third of the sample came from homeless shelters. The University of Minnesota Institutional Review Board approved the study. Participants gave informed consent and received a cash incentive as reimbursement for their time.

Focus group discussions lasted approximately 90 min and were audio-taped. Questions examined personal, behavioural and environmental influences on grocery shopping and food choice, and were framed in the context of Social Cognitive Theory constructs. The following are examples of questions: 'How often do you shop for food? How long do your food stamps last?' (behavioural); 'Where do you typically do your food shopping? How do you get to the store?' (environmental); and 'How do you choose where you shop? How do you prioritize what foods you buy?' (personal). After transcribing the focus group tapes verbatim, researchers independently analysed each transcript using open-coding methods and reconciled discrepancies. Major themes and sub-themes emerged as the most commonly occurring codes in the series of transcripts.

Participants provided demographic information and completed a written grocery shopping activity, which took an additional 20–30 min. The purpose of the activity was to transition the women into talking about how they prioritize food purchases given limited resources. For the activity, they received a list of 177 food items and their prices (taken from local grocery stores) and were asked to write down what they would purchase on a budget of $US 50 for a one-week period, adding any missing items to the list. All Thrifty Food Plan food groups were represented on the list, along with generic, name brand, frozen, canned, processed and fresh options. Fifty dollars was chosen for this scenario because the average food stamp household in 2005 received $US 209 per month, equating to $US 48·60 per week over 4·3 weeks[10].

Height and weight were measured following a standard protocol and used to calculate BMI (kg/m^2). Participants were categorized as underweight (BMI $< 18{\cdot}5$ kg/m^2), normal weight (BMI = 18·5–24·9 kg/m^2), overweight (BMI = 25·0–29·9 kg/m^2) or obese (BMI $\geq 30{\cdot}0$ kg/m^2)[11].

Demographic and grocery shopping data were analysed using the SPSS for Windows statistical software package version 12·0 (SPSS Inc., Chicago, IL, USA). Food item frequency and mean data from the activity were also organized in the Excel 2003 software (Microsoft, Redmond, WA, USA).

Results

Demographics

Ninety-two females, mean age 37 years, participated; 51 % were African-American, 27 % were Native American and 13 % were Caucasian (Table 1). Most participants received food stamps, were unemployed and had an annual income of less than $US 10 000; 50 % had completed some college (Table 1). Seventy-six per cent of participants were overweight or obese (BMI $\geq 25{\cdot}0$ kg/m^2) at the time of the study. More than half the women characterized their and their children's diets as 'fair' to 'good' and ranked their children's health better than their own (Table 2).

Major themes from the focus groups included: (i) factors influencing where and when low-income women shop; (ii) how low-income women prioritize their food purchases; (iii) strategies to stretch food dollars; and

Table 1 Demographics of focus group participants: low-income mothers/female guardians with at least one child aged 9 to 13 years, Minnesota, USA

Characteristic	*n*	Mean	SD
Age (years)	92	36·6	8·0
Household size	91	4·4	1·9
Children in household	92	3·2	1·7
	n	%	
Race/ethnicity			
Caucasian	12	13·0	
African-American	47	51·1	
American Indian	25	27·2	
Hispanic	2	2·2	
Other	6	6·6	
Income (annual)*			
<$US 5000	40	44·4	
$US 5000–9999	21	23·3	
$US 10 000–19 999	18	20·0	
$US 20 000–39 999	9	10·0	
≥$US 40 000	2	2·2	
Education level completed*			
≤8th grade	3	3·3	
Some high school	10	11·1	
High school graduated, GED or equivalent	32	35·6	
Some college/technical/vocational school	27	30·0	
Completed college/technical/vocational school	18	20·0	
Living situation			
Non-transient (home base)	53	57·6	
Transient (shelter base)	39	42·4	
Currently employed			
Yes	28	30·4	
No	64	69·6	
Currently using food stamps			
Yes	77	83·7	
No	15	16·3	

GED, General Educational Development.
*n 90.

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Table 2 Focus group participants' measures of weight status and own perceptions of diet and health: low-income mothers/female guardians with at least one child aged 9 to 13 years, Minnesota, USA

Measures of weight status	*n*	Mean	SD
BMI (kg/m^2)*	88	32·9	8·9
BMI category*	*n*	%	
Underweight (<18·5 kg/m^2)	1	1·1	
Normal weight (18·5–24·9 kg/m^2)	20	22·7	
Overweight (25·0–29·9 kg/m^2)	15	17·0	
Obese (≥30·0 kg/m^2)	52	59·1	

	Poor		Fair		Good		Very good		Excellent	
Diet and health statements	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
In general, you would say your diet is:	12	13·0	36	39·1	35	38·0	6	6·5	3	3·3
In general, you would say your health is:	4	4·3	29	31·5	36	39·1	18	19·6	5	5·4
In general, you would say your child's diet is:	7	7·7	26	28·6	31	34·1	17	18·7	10	11·0
In general, you would say your child's health is:	–	–	14	15·6	30	33·3	25	27·8	21	23·3

*n 88, pregnant women excluded.

(iv) children's role in grocery shopping. Representative quotes are presented in Table 3.

Factors influencing where and when low-income women shop

Participants reported shopping at a variety of establishments, including retail grocery stores, meat markets, discount stores, wholesale stores and corner stores. Store location was a major factor for most women because they did not have their own cars and relied on alternative forms of transportation to complete their shopping. Apart from walking and bike riding, participants frequently paid for their rides to the store, whether they took a city bus, taxi, informal taxi, or rode with a friend or family member. Rides typically cost about $US 5 but one woman said hers charged $US 20 per trip.

Most women shopped with food stamps and limited their shopping to food stamp vendors such as larger retail grocery stores. Many shopped at meat markets which also accepted food stamps, because they perceived the meat there as fresher and of higher quality. Discount stores offered lower prices on several items listed by participants, such as fruits, luncheon meats and juice boxes, but sometimes at the expense of taste. Whereas participants liked the option of buying in bulk from wholesale stores, shopping there was limited because these vendors do not accept food stamps. Although corner stores were conveniently located, participants shopped at them less frequently because their prices were generally higher.

Transportation affected the women's shopping frequency, which varied from once a day to once a month. For example, those who had cars could go as needed, whereas others who depended on friends or family for rides were limited to their availability. High gasoline prices surfaced as a barrier to shopping regardless of transportation mode, as it was thought to also influence food prices. Women who walked or rode the bus were limited in the amount of food they could purchase on a given shopping trip by what they could physically manage. As one participant commented: 'There are certain things I buy at certain food stores. I can buy certain foods at Store A, but there are certain foods I can't get at Store A, I have to go somewhere for them, and now you gotta talk about transportation to this store, you got to carry 3–4 bags, and I'm by myself.'

How low-income women prioritize their food purchases

Most participants cited meat as their most important food purchase, for which they allocated the largest portion of their food dollars, up to 50% for some. One woman explained, 'Cause at least if you get some meat, you can create and throw something with it…whether it's potatoes, rice, noodles, something…some cream of mushroom soup on it…something!' For several, meat was perceived as the most expensive component of their diet but also the most important. Many of the women remembered growing up eating meat during meals and ceremonies (i.e. Native American participants) and others simply found it filling. Meat was the basis for most women's grocery shopping and meal planning. According to the grocery shopping activity, participants spent most of their hypothetical budget on higher-fat, cheaper cuts of meat (i.e. ground beef, hot dogs) and reported 'meat, poultry, fish and eggs' not only as their favourite food group, but the one they would spend more on if their food stamp benefits increased (Table 4).

Participants made subsequent food purchases based on a variety of factors, including what the household needed and what items could be obtained through other food assistance programmes, such as dairy through the Special Supplemental Nutrition Program for Women, Infants, and Children, and canned goods from local food shelves/food pantries. Starches (e.g. rice, noodles) were common,

Table 3 Focus group quotes representing major themes and sub-themes: low-income mothers/female guardians with at least one child aged 9 to 13 years, Minnesota, USA

Factors influencing where and when low-income women shop	
Store type	'So what I do is, you know, when my stamps come, you know, I make dates, I would go back to back. Today I would go to the meat market and get my meat pack. Tomorrow I would go to Store A and get my other stuff. And then the next day I would go like to Store B, I would do all that stuff within that week. And I would have so many food stamps that I would spend at each store, you know what I'm sayin'.' (Age 36 years, BMI 34·0 kg/m^2, pregnant)
Transportation	'…well, it all depends, actually. On my ride. If they wanna take me to both places [laughs] I'll go, I'll go to Store C and to Store D, and I would spend um, my cash at Store C on different items, 'cause I can get it in bulk. And then I'll go to Store D and get the food… But it all depends on my ride. Um, 'cause sometimes I might have 'em for 15 minutes and another I might have 'em for two days.' (Age 44 years, BMI 36·8 kg/m^2)
How low-income women prioritize their food purchases	
Buy meat first	'I go to the meat first, 'cause that's the highest…so if I wanted a pot roast or a pack of bacon, I'm going to the meat first so I can calculate you know some of them carts have a calculator up on it…whatever it come up to, if I got a little extra then I'll go to the…milk…cereal, my butter, my cinnamon rolls, my cakes, my cookies, if I got enough. But I do my meat first…'cause I'm more of a meat person. I could cook them something like rice but I won't eat it, just give me my pork chop. You know, so that's how I am. So I go meat first.' (Age 39 years, BMI 37·3 kg/m^2)
Supplementary food items	'…I also use um, the food shelf, um, we go once a month, and then I get WIC for the two little children… So then we get our milk and our cheese and our eggs and tuna, because I'm a breastfeeding mom so I get the tuna and the carrots now, and Juicy Juice. And then my mother on Saturdays uh, brings us a hot dish, and then during the school year the kids do qualify for the free lunch, so then they get that during the school year.' (Age 41 years, BMI 22·4 kg/m^2)
Storage space	'…I know that I need chicken or that you know, all the meats, and well then in here you can't even buy a lot of meat because of the, I have a 'frigerator but it's still small. You can't fit a lot of stuff in there. Like the boxed stuff, you can't fit in there. The other stuff, and other frozen stuff.' (Age 30 years, BMI 37·5 kg/m^2)
Strategies to stretch food dollars	
Store discounts	'…I just kinda watch the ads and if it's like the 10 for $10 sale…I stock up on the fruits and things wherever the sales are, I try to cut coupons, and save there, so if something's buy one get one free, I try to do that, and it doesn't always work out because we have a bunch of stuff at home and no meat to go with it, you know…' (Age 36 years, BMI 53·9 kg/m^2)
Buy in bulk	'…if you ever see me shoppin', ya'll be thinkin' I'm shoppin' for like a whole army…I wanna get all of this so I won't have to come back here and do all of this and, and I just get it. And whatever I don't get, like I said, I'll wait till I get a check or whatever, then I'll go get maybe…like some hot sauce, and all that, and then if you go to Store A, you get bread and then you can get about eight loaves of bread, see when I get bread, I freeze it. I just let it stay in the freezer…then my stuff will last me almost, almost for two months, almost, you know…' (Age 45 years, BMI 36·4 kg/m^2)
Avoid waste	'You don't do Thursday nights, do you? You pull everything out the 'frigerator that you've been cookin' from Sunday… I just have Child A and Child B, but I make sure they have two helpings and always fix extra, like it's uh, two more people in the house, and my leftovers, I put 'em in the freezer in Ziploc bags. So then when your food stamps down low, and the weather be real bad…you can't get out there to the grocery store…pull it out!' (Age 46 years, BMI 23·9 kg/m^2)
Children's role in grocery shopping	
Put unnecessary items in cart	'I don't take my kids shopping because I spend twice as much money as I would [laughter] 'cause they want the chips, the pop, the gum, the candy, the ice cream…' (Age 42 years, BMI 37·8 kg/m^2)
Help plan and shop	'…they're really good. I mean, they'll even look and say well, mom, you know, we need eggs, or mom we need cheese…they're pretty aware, I bring 'em with and I let 'em know how much it costs and why we can't afford that this week and next week we'll get it or, and I usually tell 'em they get one thing a piece when we go to the store.' (Age 39 years, BMI 38·9 kg/m^2)
Individual preferences, appetites, allergies	'I have a child that is like a human garbage disposal…she'll eat anything and everything, and then I have…then I have a daughter who's allergic to a lot of things and then she's picky with things, too.' (Age 30 years, BMI 26·8 kg/m^2)

WIC, Special Supplemental Nutrition Program for Women, Infants, and Children.

inexpensive purchases, as they often accompanied meats as a filling side dish, and breakfast foods (e.g. eggs, cereal) were quick and easy for their children to prepare. Potatoes, generic white bread, Ramen noodles and whole-wheat bread were among the top items on which the group spent the most money, but they still spent nearly three times as much on meats (Table 4).

Vegetables were frequently mentioned as part of the main meal, yet foods from this group, with the exception of potatoes, failed to make up a significant portion of the participants' budgets in the grocery shopping activity. During the discussion, many participants expressed that although they like the taste, they were limited by the perceived high cost of fresh produce, and some felt that canned versions were poor substitutes but consumed them anyway because they were free from the food shelves/food pantries. Others mentioned they would like to shop at local farmers' markets but did not have cash to spend there and food stamps were not accepted. Milk was another item participants said was expensive, and they were often unable to maintain a supply in the household over the entire month. Kool-Aid was a common household

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Table 4 Focus group participants' food choices (favourite food groups, the most commonly purchased food items from the grocery shopping activity, the food items they spent most on, and the food groups they would purchase more from with increased food stamps): low-income mothers/female guardians with at least one child aged 9 to 13 years, Minnesota, USA

Favourite food groups*	*n*	%	Most commonly purchased food items†	*n*	%
Meat, poultry, fish, and eggs	74	80·4	Ground beef	63	70·0
Fruits	64	69·6	Potatoes	54	60·0
Cereal, bakery, bread, rice, pasta	59	64·1	Hot dogs	45	50·0
Vegetables	55	59·8	Ramen noodles	45	50·0
Dairy products (milk, cheese, yoghurt)	52	56·5	Bananas	43	47·8
Kool-Aid, juice, fruit punch, lemonade	33	35·9	Generic white bread	43	47·8
Salty snacks (chips, pretzels, Cheetos, etc.)	33	35·9	Large eggs	42	46·7
Pop	27	29·3	2 % milk	40	44·4
Sweets (cookies, cakes, candy)	25	27·2	Pork chops	32	35·6
Fats (oils, butter, lard)	11	12·0	Chicken breasts	32	35·6
			Sugar	32	35·6
Food items by mean amount spent†,‡,§	**$US**		**Food group purchased with increased food stamp benefits‖**	***n***	**%**
Ground beef	5·19		Meat, poultry, fish, and eggs	59	76·6
Chicken breasts	2·76		Dairy products (milk, cheese, yoghurt)	40	51·9
2 % milk	2·03		Fruits	36	46·8
Pork chops	1·60		Vegetables	35	45·5
Hot dogs	1·60		Cereal, bakery, bread, rice, pasta	25	32·5
Potatoes	1·39		Kool-Aid, juice, fruit punch, lemonade	10	13·0
Generic white bread	1·15		Pop	8	10·4
Ramen noodles	1·13		Salty snacks (chips, pretzels, Cheetos, etc·)	5	6·5
Fish	0·96		Sweets (cookies, cakes, candy)	3	3·9
Whole-wheat bread	0·93		Fats (oils, butter, lard)	3	3·9

*n 92.
†Missing data, n 90.
‡Calculated as mean × unit price from food list.
§Sum by food group: meat = $US 12·11, grains = $US 3·21, dairy = $US 2·03, vegetables = $US 1·39.
‖Non-recipients of food stamps excluded from analysis, n 77.

beverage, as one mother remarked: 'My children love Kool-Aid. I buy 20–30 packs a month. And I buy two big 20 pound bags of sugar… We can't afford the juices, they're expensive…so as a poor mom, we go with Kool-Aid.'

Women residing in homeless shelters at the time of the study prioritized their food purchases differently than if they had a home base, mainly because of food storage issues. Those living in a shelter where three hot meals were served daily resorted to spending their food money on non-perishable, individually packaged beverages and snacks, such as cases of pop, juice boxes, Little Debbie snacks and chips, to avoid attracting pests in their rooms as mandated by shelter policy. Fresh fruits were not allowed as an in-room snack option. Some women lived in a homeless shelter where rooms were furnished like an apartment, with either a cook-top or stove with an oven, a small or regular-sized fridge, and a microwave. They tended to shop more frequently because they had limited space to store perishable items, and many fried or microwaved foods if they did not have an oven.

While the FSP currently does not allow participants to purchase hot deli or ready-to-eat foods (hereafter referred to as 'RTE foods') with their food stamps, 48 % of FSP participants in the present study reported buying these foods regularly with their other food money and 79 % would like to be able to buy them with their allotments, citing taste and convenience as reasons why. For most, these benefits outweighed the additional cost of the ready-prepared food.

Strategies to stretch food dollars

Most women reported that their food stamp allotments lasted two to three weeks out of the month depending on how they spent the money when they shopped. Some explained that if they shop 'careless' or shop with their children, their food stamps do not last as long. Participants expressed shopping savvy, as they described where to go for certain food items, such as discount stores for produce and meat markets for customized meat packs. Specifically, the butchers at meat markets could create meat packs based on their budget and taste preferences. The women also knew which generic foods tasted good and where to buy in bulk. Most women employed a combination of strategies, as one participant remarked: 'We went to Store B yesterday and what I noticed is like their canned goods were more expensive and if I go to Store C I could get like two cans of corn for $0·88 versus $0·69 for one can, so we didn't get any canned goods at Store B… we'll go across the street to Store C and get the canned goods over there… We'll buy the big old thing of ketchup… The ketchup goes fast, so buyin' in bulk helps.'

Within the household, participants took measures to stretch their food supply and avoid waste throughout the month. Most struggled to keep perishable items such as milk and fruit routinely available because their families strongly liked them and consumed them quickly; if the family disliked them, they were rarely purchased.

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To prevent wasting milk, one woman explained: 'He'll [son] eat the cereal and leave the whole bottom of the bowl…full of milk… I pour it in a separate container, put the lid on it, and when he needs some milk, he gets that milk.' Others ate leftovers to avoid wasting food and skipped meals to ensure their children ate first.

Children's role in grocery shopping

Many women said their children would join them while grocery shopping, which often led to higher grocery bills. Children exerted influence over their parents while they made food choices and shopping decisions, most often by putting unnecessary items in the cart, as one participant commented: 'They're always trying to get something colorful and noisy.' At the store, some women allowed their children to pick out certain food items such as cereal, fruit or a snack, whereas others took requests before they went to the store and shopped alone. The women regularly bought cereals they knew their children would eat, which were usually of the sweetened variety. They also purchased food items the children could prepare on their own if they did not want to or were unable to cook, as one woman shared: 'I don't know what they [the children] do at home… I be gone… Only thing I know he get up in the morning and he get on that game [video game]. And I don't think he be thinkin' about no cereal or nothin' else… I come home and go to bed… He get him some Ramen noodles, a hot dog, a bag of chips, and he do whatever he gotta do… Back on the game.'

Children could, however, be helpful during the shopping process. Some participants, most often Native Americans, said their children assessed household needs while they made a grocery list, while others would have their children retrieve items at the store and then help carry bags of groceries home. A few children were apparently mature enough to shop themselves, as one woman commented: 'I do send my 13 year-old shopping also. He goes shopping for me… He can use food stamps… Sometimes he'll take the bikes or they'll walk… He surprised me just the other day and took the bus by himself… And he went and got whatever we needed and came back… The store people talk about him, too – they're all, what a good kid… He's really helpful in the household.'

Some participants perceived their food stamp allotments as inadequate if their children had large appetites or unique food preferences. For example, a mother remarked: 'My food stamps don't last 'cause I got big eaters…' For fussy children or those with food allergies, catering to their individual needs was something participants simply could not afford. Eating school breakfast and lunch helped stretch food dollars during the school year, but once the children were out for the summer, grocery bills often increased because more meals were consumed at home.

Discussion

The key findings from the present study are that low-income women's grocery shopping behaviour appears to be driven not only by their families' personal preferences, but also by their economic and environmental situations. Despite employing numerous strategies to stretch their food dollars, most participants felt they could not purchase their ideal diet. According to the qualitative and quantitative data, they spend most of their money on meat, which is not only their favourite food group, but also the one they would spend more money on if their food stamp allotments increased. Participants' emphasis on the importance of meat in the household and their desire to purchase more meat (often cheaper and higher-fat varieties) and RTE foods instead of fruits and vegetables (hereafter referred to as 'F&V') may partly explain the high rates of overweight and obesity in the sample, as food purchasing habits tend to reflect consumption patterns.

Factors influencing where and when low-income women shop

Store accessibility, food prices and food stamp policies were major factors affecting where participants shopped during the month. Participants inevitably paid for their trips to the grocery store, whether it was in the form of gasoline for their own cars, a bus ride or a ride from a friend. Even if they walked, the women could only carry so much and, in turn, made more frequent trips for smaller, higher priced packages. This combination of factors, along with the distribution of food stamp allotments on a monthly basis, may explain why many women tend to shop only once a month. Bhargava[12] linked shopping frequency to increased dietary quality among a large sample of food stamp participants (n 919), including increased Ca, fibre and β-carotene densities. However, whereas shopping more frequently may help low-income families maintain a more consistent supply of perishable items such as milk and fresh produce, participants in the present study felt those types of foods were too expensive to consume throughout the month. Hendrickson *et al.*[6] found that fresh F&V at local stores in two urban Minnesota neighbourhoods were not only expensive, but also limited in variety and poorer in quality. These results suggest that the environment in which low-income families obtain food may be one of several barriers to the consumption of a healthy diet, a theme commonly reported in the literature[13–16].

How low-income women prioritize their food choices

The majority of participants prioritized meat as their most important food purchase as it was the central component of breakfast and dinner meals, and participants were willing to spend larger portions of their budget on a

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supply of meat for the month compared with other food groups. As in our study, meat expenditure and consumption data indicate that low-income households, including those on food stamps, buy and eat more meat, especially cheaper cuts of lower-quality meat (e.g. ground beef, stew meat), than households of higher incomes[17–21]. Yet our qualitative data may elucidate some of the reasons why low-income families prefer meat and spend more money on it, including the mothers' upbringing, ethnic traditions, taste, the important status of meat in meals, and meat's versatility in meal preparation. We speculate that despite financial constraints, participants may still be willing to spend more of their food dollars on meat because it is considered a status food in American culture and may increase familial self-esteem. Meat consumption may, in essence, be part of participants' self-identities, which have been associated with eating and shopping behaviour and BMI in the literature[22].

Meat was clearly essential to the diets of women in the present study, but the implications of high meat consumption (and low F&V consumption) did not seem to be much of a concern. Such a disconnection between diet and health relationships was also reported in a qualitative study by Bradbard *et al.*[21]. Since meat intake has been positively associated with various types of cancer[23], high blood pressure[24] and metabolic syndrome[25], recent data show that higher-income Americans have cut back on their meat consumption[26]. Thus, understanding why low-income groups prefer meat may shed light on why they have not picked up on this trend, which is critical information given that the poor are disproportionately affected by such diseases[27,28].

Regarding F&V consumption, participants in the present study felt these types of foods were expensive and because some had picky children in the household, they were not always eaten before spoiling. Yeh *et al.*[29] found that, regardless of socio-economic status, most Americans do not consume the recommended number of servings of F&V, and high cost and spoilage rates were major deterrents in their tri-ethnic sample. Other factors that may affect low-income households' F&V purchasing and consumption patterns are disliking the taste[15,30] and not knowing what constitutes adequate daily intake[31]. For example, Dibsdall *et al.*[31] found that 73 % of their low-income sample believed they were healthy eaters, yet 82 % consumed less than five servings of F&V per day. Most low-income respondents to a food survey administered by Eikenberry and Smith[13] listed F&V as a main component of 'healthy eating' but defined the actual concept thirty-three different ways, suggesting that lack of nutrition knowledge of a 'healthy diet' is another barrier to its consumption. If low-income consumers do not understand how a healthy diet is defined, this may explain why they would prefer to buy more meat and RTE foods first (Table 4). Research has shown that low-income households' F&V expenditures do not change significantly despite small increases in income[32].

Strategies to stretch food dollars

Participants cited numerous strategies they used to help stretch their food dollars; even those receiving food stamps experienced hard times. Most participants shopped by price, availability of in-store specials such as '10 for $10', and knew which stores to go to for better deals, common strategies practised by other low-income individuals reported in the literature[33,34]. Within the home, maintaining the food supply and avoiding waste were concerns, and participants reported using leftovers and in some cases fasting in order to feed their families. Similar strategies, most notably fasting, often referred to as 'maternal deprivation'[35], have been reported elsewhere[33,35–37].

Children's role in grocery shopping

Participants in the present study described numerous scenarios in which their children influenced the household food choices. Children often made requests for snacks or hid items in the grocery cart without asking, and many got away with it, which are common parent–child grocery shopping experiences also reported by others[17,38,39]. Conversely, some participants in the current study credited their older children with actually being helpful shoppers, at times taking on the responsibility of making trips to the store alone. Larson *et al.*[40] found that low-income students in Minneapolis–St. Paul assisted with food tasks, including shopping and preparation, significantly more frequently than students of middle and high income; however, for female students, shopping was associated with greater intake of fried foods.

Some women in the present study felt that food stamp allotments should be based on the appetites and growth spurts of their children, not just the household size. For example, participants with teenage boys reported their food stamps ran out quickly, a problem also reported by Hoisington *et al.*[36]. So while children may play a notable role in household food decision making, their appetites cannot necessarily be controlled. Therefore, parents may need to employ more authoritative parenting skills so that children are still given some food choice but within boundaries, considering that authoritative feeding styles have been associated with lower risk of overweight[41], greater F&V availability, and increased consumption of dairy and vegetables among young children[42].

Conclusions

Nutrition education that teaches food budgeting skills and meal preparation strategies involving less meat and more F&V could be useful in helping low-income families make the best use of their food dollars from a health standpoint. Suggested improvements to the FSP include granting

specific F&V allotments and promoting the option to use food stamps at local farmers' markets due to high costs in retail grocery stores. Nutrition education should also be directed towards children, as they appear to play an integral role in food-related activities, and food habits and preferences established early in life tend to carry on into adulthood. Changing low-income families' food preferences for meat will require more research because it appears to play a major role in their food choices; the question is whether education can offset these personal preferences. Since consumption of a diet high in meat and low in F&V has been linked to overweight, obesity and chronic illnesses[26–28,43–45], the relationship between diet and health must also be brought to the forefront with this population.

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