

Food Intake Patterns of Homeless Youth in Toronto

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ABSTRACT

Objective: To explain the low nutrient intakes of homeless youth in Toronto by looking at their usual food intake patterns and the food they obtained from charitable programs and their own purchases.

Methods: Interviews were conducted with 261 homeless youth (149 male, 112 female), recruited from outdoor locations and drop-in centres in downtown Toronto. Drawing on data from two 24-hour dietary intake recalls, youths' usual food intakes were estimated and compared to Canada's Food Guide recommendations. The nutritional quality of youths' food intakes from charitable meal programs and food purchases was compared.

Results: The mean usual food intakes for homeless males and females were well below current recommendations for all four food groups and below the usual intakes of adults, 19-30 years, in the general population. On a given day, youths' mean energy intakes were 1962 ± 1394 kcal for females and 2163 ± 1542 kcal for males, with more energy coming from "other foods" than any other food group. Regardless of whether they obtained food from charitable meal programs or purchased it for themselves, youths' mean intakes from the four food groups were very low and most youth consumed no whole grains or dark green or orange vegetables (i.e., foods recommended in Canada's Food Guide).

Conclusion: The low nutritional quality of youths' food intakes is consistent with the high prevalence of nutrient inadequacies previously documented in this sample. The existing food acquisition strategies of homeless youth appear to be insufficient for them to meet their nutritional needs.

Key words: Homeless youth; food; diet; nutrition assessment

La traduction du résumé se trouve à la fin de l'article.

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Youth represent a growing and particularly vulnerable subgroup of the homeless population in Canada.¹⁻³ Homeless youth struggle to meet basic needs and experience relatively high levels of abuse, addiction, and mental and physical health disorders.^{4,5} Among the many challenges they face is the daily search for food.⁶⁻⁹ Our study of 261 homeless youth in Toronto revealed high levels of nutritional vulnerability in this population.¹⁰ Over half of the youth had inadequate intakes of folate, vitamin A, vitamin C, zinc, and magnesium; additionally, more than half of the females in this sample had inadequate intakes of iron and vitamin B12.¹⁰

Homeless youths' options for food acquisition are in part a reflection of the dominant community responses to growing concerns about homelessness locally.¹¹ Services, including charitable meal and snack programs, have been established to help homeless people meet basic needs. At the same time, law enforcement policies and practices have been introduced in many jurisdictions to curtail panhandling and squeegeeing,¹²⁻¹⁵ which are youths' main sources of income to purchase food.¹¹ Both kinds of community response must affect homeless individuals' food access, but the impact of these initiatives is unknown.

In this study, we seek: a) an explanation for youths' low nutrient intakes by looking at their usual food intake patterns, and b) an evaluation of the food obtained by youth from charitable programs and their own purchases. A closer examination of the food attained from these two sources is necessary to better understand the relative nutritional merit of each food acquisition strategy, and thus inform deliberations about local-level programs and policies that affect food access through these routes.

METHODS

Participant recruitment, eligibility, and data collection methods are described in detail elsewhere.¹⁰ We recruited 261 youth (83% par-

ticipation rate) from outdoor locations and downtown drop-in centres, including youth 16-24 years who were not currently pregnant, and who had been without stable, secure housing arrangements (sleeping in a temporary shelter, indoor or outdoor public space, or friend's place, because they had no place or no safe place of their own) for at least 10 nights in the last 30. When recruited, participants were asked to complete an interviewer-administered questionnaire and a 24-hour dietary intake recall. One hundred and ninety-five participants (75%) completed second interviews and 24-hour recalls 3 days later or as soon thereafter as possible. During the 24-hour recall, the interviewer classified the source of the food into one of six options: food from a charitable program; food purchased by the participant; food obtained from other people; food from a food bank; self-acquired food from garbage or waste; and food from an unreported source. The 24-hour recall data were analyzed using the Nutrition Survey System (NSS) developed by Health Canada. All statistical analyses were performed using SAS/PC Version 9.1 (SAS Institute). The study protocol was approved by the University of Toronto Ethics Review Office.

Foods were assigned to one of the four food groups in Canada's Food Guide (CFG),¹⁶ with serving sizes calculated using conversion tables from the Canadian Nutrient File.¹⁷ Foods in these groups were further broken down into subcategories emphasized in the CFG (e.g., dark green vegetables, whole grains, lean meat, poultry, and fish, and lower-fat milk products). Foods that were not part of the four major food groups, such as fats and oils, condiments, alco-

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hol, non-nutritive beverages, and foods high in sugar, fat, or salt, were assigned to an "other foods" group. Mixed foods (e.g., pizza, fast food sandwiches) were broken down into their ingredients, using recipe proportion tables from the Canadian Nutrient File.¹⁷ To further describe youths' food selection patterns, their intake from each food group was calculated as a proportion of their total energy intake.

The distribution of usual food intakes for each CFG food group was estimated for youth who had completed two 24-hour recalls (81 females, 114 males) using C-SIDE software.¹⁸ C-SIDE adjusts for day-to-day variability in intakes and is specifically designed to accommodate food intake data in which a large proportion of the sample report zero intakes for a particular food group on a single day, as seen in our study.¹⁸

To determine the relationship between youths' food intakes and food sources, Spearman rank correlations between total servings from each CFG food group and the percentage of total energy intake from charitable programs and purchases over the 24-hour recall period were calculated. This nonparametric test was selected because the food intake distributions were heavily skewed.

To gain further understanding of the kinds of food youth acquired through charitable programs and purchases, a detailed review of dietary recalls that included substantial food intake from either source (defined as >800 kcal of food, not including alcohol) was conducted.

RESULTS

Sample characteristics are described in Table 1. Over half of youth (63%) had been homeless for more than one year. Most youth earned money in the informal or illegal economy, with only 6% reporting some form of government assistance as their main source of income. The main sources of food for homeless youth were charitable programs, purchases, and other people. It was common for youth to rely on multiple income-generating strategies and multiple sources for food.

Youths' mean energy intakes were 1962 ± 1394 kcal for females and 2163 ± 1542 kcal for males over the first 24-hour recall period. Their mean usual food intakes were well below current recommendations for all four food groups¹⁶ and below the usual intakes of adults, 19-30 years, in the general population¹⁹ (Table 2). The homeless youth, on average, consumed fewer than half of the number of servings of fruits and vegetables reported by young adults in the general population. Homeless females' intakes of foods from the milk and alternative and meat and alternative categories were less than one half of those among women in the general population.

Homeless males and females received more energy from "other foods" than from any other food group (Figure 1). Compared to young adults in the general population, homeless females obtained twice as much of their energy from other foods (50% versus 24%) and homeless males obtained 50% more of their energy from these foods (39% versus 26%).¹⁹

When youths' food group intakes were examined by source, average intakes from food purchases or charitable programs were both relatively low (Table 3). Moreover, the amount of food youth consumed from charitable programs or purchases was not clearly associated with their total intakes from each food group (data not shown). Consuming more food from either source was not associated with greater consumption of vegetables and fruit or grain prod-

Table 1. Sociodemographic Characteristics, Living Circumstances, and Food Acquisition Practices of Homeless Youth

	Females (n=112) n (%)	Males (n=149) n (%)	Total sample (n=261) n (%)
Age (years)			
16-18	42 (38)	30 (20)	72 (28)
19-24	70 (62)	119 (80)	189 (72)
Place where previous night had been spent			
Outdoors	75 (67)	84 (56)	159 (61)
Friend's place	25 (22)	31 (21)	56 (21)
Squat (e.g., makeshift shelters)	5 (4)	12 (8)	17 (7)
Shelter	4 (4)	12 (8)	16 (6)
Other (e.g., jail, internet café, hotel)	3 (3)	10 (7)	13 (5)
Time since leaving home (months)			
2	20 (18)	18 (12)	38 (15)
3-6	20 (18)	17 (11)	37 (14)
7-12	9 (8)	12 (8)	21 (8)
>12	63 (56)	102 (68)	165 (63)
Main source of income in last 30 days*			
Panhandling or squeegeeing†	61 (54)	83 (56)	144 (56)
Theft or drug trade work	14 (13)	32 (22)	46 (18)
Sex trade work	21 (19)	9 (6)	30 (12)
Government transfers	3 (3)	10 (7)	13 (5)
Selling items (e.g., handicrafts)	4 (4)	6 (4)	10 (4)
Money from family or friends	5 (4)	5 (3)	10 (4)
Paid employment	4 (4)	2 (1)	6 (2)
Number of different income-generating strategies employed in last 30 days*			
1	22 (20)	34 (23)	56 (22)
2	42 (37)	48 (33)	90 (35)
3	28 (25)	42 (29)	70 (27)
4	20 (18)	23 (16)	43 (17)
Food source use over a 24-hour period‡			
Charitable meal or snack programs	56 (51)	69 (49)	125 (50)
Purchases by participant	83 (75)	107 (75)	190 (75)
Food given by other people	82 (75)	68 (48)	150 (60)
Food stolen or taken from garbage	7 (6)	15 (11)	22 (9)
Food banks	1 (1)	1 (1)	2 (1)
Number of different food sources reported over a 24-hour period‡			
1	21 (19)	48 (34)	69 (27)
2	58 (53)	67 (47)	125 (50)
3	28 (25)	24 (17)	52 (21)
4	3 (3)	3 (2)	6 (2)

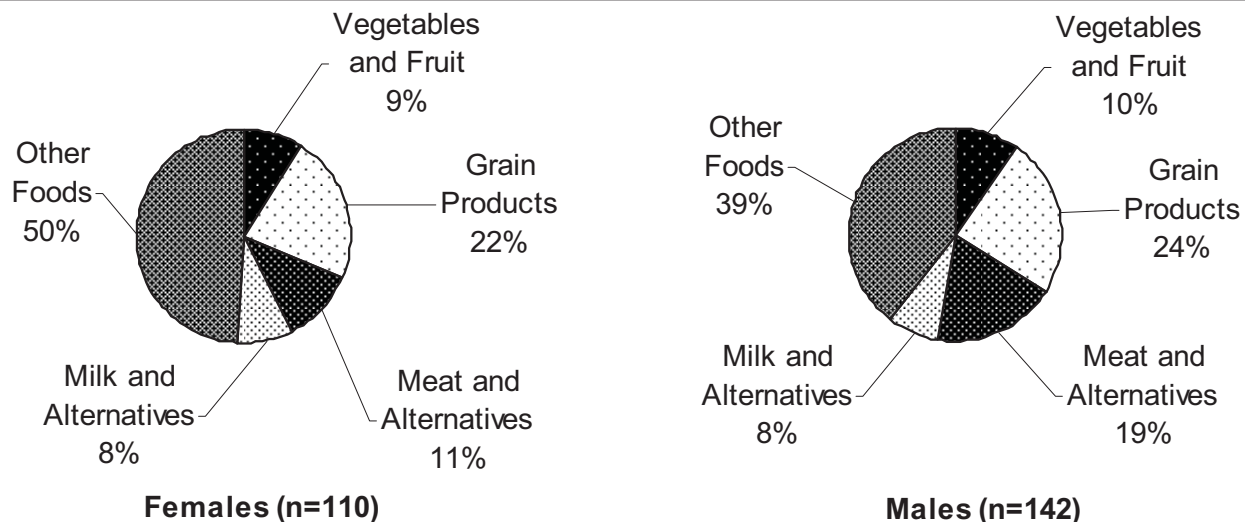
* Two males were excluded because they reported no source of income.
 † "Squeegeeing" refers to the practice of washing car windows while the car is stopped at an intersection and asking for a donation from the motorist.
 ‡ Results are based on 24-hour dietary intake recalls collected at the first interview, excluding 2 females and 6 males who reported no energy intake on the day in question and 1 male for whom no dietary intake data were available.

Table 2. Mean Usual Food Intake by Food Group (Servings per Day) of Homeless Youth and Canadian Adults, Aged 19-30

	Females		
	Homeless youth* (n=81)	Adults (19-30 y)†	Food Guide Recommendations‡
Vegetables and Fruit	1.65 ± 0.64 (1.66)	4.67	7-8
Grain Products	3.69 ± 1.24 (3.50)	5.19	6-7
Meat and Alternatives	0.96 ± 0.66 (0.83)	1.93‡	2
Milk and Alternatives	0.81 ± 0.64 (0.64)	1.64	2
	Males		
	Homeless youth* (n=112)	Adults (19-30 y)†	Food Guide Recommendations‡
Vegetables and Fruit	2.74 ± 1.54 (2.43)	5.36	8-10
Grain Products	5.17 ± 1.86 (4.90)	7.32	8
Meat and Alternatives	1.77 ± 0.81 (1.69)	3.29‡	3
Milk and Alternatives	1.07 ± 0.69 (0.94)	1.95	2

* Values are means ± SD (median), adjusted for day-to-day variability in intakes using C-SIDE software.
 † Data on the mean usual intakes of youth in the general population are drawn from the results for 19-30 year olds in the 2004 Canadian Community Health Survey, Cycle 2.2 (CCHS 2.2).¹⁹
 ‡ Published gram values for meat and alternatives¹⁹ were converted into servings, assuming 75 g per serving.
 § As outlined by Health Canada¹⁶

Figure 1. Distribution of homeless youth's total energy intake by food group*



* Results are group means based on 24-hour dietary intake recalls collected at the first interview, excluding 2 females and 6 males who reported no energy intake on the day in question and 1 male for whom no dietary intake data was available.

Table 3. Homeless Youths' Mean Food Group Intake ± SD from All Sources, Charitable Programs, and Purchases, over a 24-hour period*

Food Group	Females		
	All Sources (n=110)	Charitable Programs (n=56)	Purchases (n=83)
Vegetables and Fruit	1.83 ± 2.16	1.13 ± 1.76	0.66 ± 1.09
Grain Products	4.10 ± 4.80	1.98 ± 1.93	1.75 ± 1.77
Meat and Alternatives	1.12 ± 1.26	0.55 ± 0.59	0.45 ± 0.88
Milk and Alternatives	1.00 ± 1.93	0.33 ± 0.59	0.41 ± 0.76

Food Group	Males		
	All Sources (n=142)	Charitable Programs (n=69)	Purchases (n=107)
Vegetables and Fruit	2.92 ± 4.16	2.33 ± 3.59	1.54 ± 3.15
Grain Products	5.24 ± 5.29	3.49 ± 3.39	2.59 ± 3.02
Meat and Alternatives	1.87 ± 1.82	1.62 ± 1.77	0.95 ± 1.36
Milk and Alternatives	1.17 ± 1.74	0.77 ± 1.25	0.68 ± 1.54

* Results are based on 24-hour dietary intake recalls collected at the first interview, excluding 2 females and 6 males who reported no energy intake on the day in question and 1 male for whom no dietary intake data was available. Results displayed for charitable programs and purchases are not mutually exclusive; many youth obtained some food from both sources during the 24-hour period.

ucts. Among females, the proportion of total energy intake from purchases was negatively associated with total intake of milk products ($p < 0.05$), but milk product consumption was unrelated to food source for males. Among males, but not females, the proportion of total energy from programs was positively associated with total intake of meat and alternatives ($p < 0.05$).

The CFG encourages greater consumption of whole grains, dark green and orange vegetables, fresh fruit, and leaner meat or meat alternatives because of the particular nutritional benefits of these foods.^{16,20} However, only 25% of females and 29% of males consumed any dark green or orange vegetables and only 15% of females and 16% of males consumed any whole grain products in the course of a day (Table 4). About half of youth had eaten lean meat, fish or meat alternatives and lower-fat milk products in the day. The proportion of youth consuming any of these foods in charitable programs was higher than the proportion obtaining them through purchases. Nonetheless, over 70% of youth eating in charitable programs obtained no dark green or orange vegetables and no whole grains.

Of the 74 youth who had consumed >800 kcal in a day from food purchases, 88% had bought food from fast food restaurants (e.g., burgers, fries, pizza) or street vendors (e.g., hotdogs). Also common were pre-packaged snack foods (e.g., chips, chocolate bars, soft drinks). Among the 59 youth who had eaten >800 kcal from charitable programs in a day, breakfast cereals with milk, coffee, fruit drinks, white bread sandwiches, and hot meals consisting of rice, pasta, or potatoes, with meat and a vegetable were commonly reported.

DISCUSSION

The homeless youth in our study not only failed to meet the minimum recommendations in the CFG, but their usual intakes of food from the four food groups were well below those of young adults in the general population. Moreover, the foods youth consumed within these food groups were not typically those with very high nutritional value.¹⁶ These findings are consistent with the low nutrient intake levels and high prevalence of nutrient inadequacies previously documented in this sample.¹⁰ Specifically, homeless youths' very low intakes of milk products account for their low calcium intake levels, and this coupled with their very low vegetable consumption also explains why 79% of males and 64% of females had inadequate vitamin A intakes. Their very low intakes of vegetables and fruit also account for the 76% and 79% prevalences of inadequacy for vitamin C among males and females respectively. Over three quarters of youth had inadequate folate intakes, reflecting their low fruit and vegetable intakes and suboptimal consumption of fortified grain products. Youths' very low intakes of whole grain products and dark green vegetables help to explain the fact that 83% had inadequate magnesium intakes. The fact that mean and median intakes of meat and alternatives fell so far below CFG recommendations for this food group is consistent with the finding that 21% of males and 35% of females had inadequate protein intakes, 52% of females had inadequate iron intakes, and 58% of females had inadequate vitamin B12 intakes. The low consumption of meat and alternatives and whole grains must also underpin youths' high prevalences of inadequacy for zinc (58% for males and 77% for females). Given the durations of homelessness

Table 4. Proportion of Homeless Youth Consuming Any Food from a Specific CFG Subgroup, by Source of Food, over a 24-hour Period*

Food Group	Females			Males		
	All Sources (n=110) n (%)	Charitable Programs (n=56) n (%)	Purchases (n=83) n (%)	All Sources (n=142) n (%)	Charitable Programs (n=69) n (%)	Purchases (n=107) n (%)
Vegetables and Fruit						
Any vegetable or fruit	81 (74)	26 (46)	41 (49)	115 (81)	44 (64)	62 (58)
Dark green and orange vegetables	27 (25)	9 (16)	9 (11)	44 (31)	20 (29)	17 (16)
Potatoes and other vegetables	67 (61)	19 (34)	33 (41)	104 (73)	37 (54)	54 (50)
Fruit	22 (20)	7 (12)	5 (6)	25 (18)	6 (9)	10 (9)
Juice	21 (20)	10 (18)	4 (5)	33 (23)	16 (23)	11 (10)
Grain Products						
Any grain product	100 (91)	43 (77)	51 (61)	131 (92)	59 (86)	68 (64)
Non whole grain	95 (86)	41 (73)	49 (59)	129 (91)	56 (81)	67 (63)
Whole grain	17 (15)	7 (12)	2 (2)	23 (16)	10 (14)	2 (2)
Meat and Alternatives						
Any meat or alternative	84 (76)	36 (64)	40 (48)	124 (87)	56 (81)	65 (61)
Processed meat and fattier cuts	63 (57)	21 (38)	29 (35)	103 (73)	45 (65)	55 (51)
Lean meat, fish, and meat alternates	61 (55)	30 (54)	18 (22)	68 (57)	37 (54)	19 (18)
Milk and Alternatives						
Any milk or alternative	81 (74)	29 (52)	39 (47)	98 (69)	43 (62)	50 (47)
Higher fat milk products	58 (53)	17 (30)	29 (35)	74 (52)	20 (29)	44 (41)
Lower fat milk products	55 (50)	20 (36)	20 (24)	71 (50)	39 (57)	21 (20)

* Results are based on 24-hour dietary intake recalls collected at the first interview, excluding 2 females and 6 males who reported no energy intake on the day in question and 1 male for whom no dietary intake data was available. Results displayed for charitable programs and purchases are not mutually exclusive; many youth obtained some food from both sources during the 24-hour period.

reported in this study, the high levels of nutrient inadequacy and the poor food intakes of homeless youth constitute a serious threat to their long-term health.

Most youth in this study subsisted outside the social safety net, earning money for food through panhandling, squeegeeing, and other forms of ‘work’ in the informal economy. Their access to income through these routes was limited and highly contentious; 48% reported that the police had recently stopped them or tried to stop them from making money.¹¹ In addition to youths’ financial constraints, their homelessness limited the kinds of foods they could buy, causing them to rely on fast food and pre-packaged snacks.

Many studies of homelessness and nutrition have examined the quality and quantity of food served in charitable programs.²¹⁻²⁴ In our study, the food obtained from programs appeared more varied than food purchases, but only half of youth ate in charitable programs in the course of a day and the foods they consumed were not clearly nutritionally superior to those youth purchased for themselves. This observation is consistent with the results of a recent nutritional assessment of the meals served in 18 charitable programs in Toronto.²⁵ Although there was wide variation in the energy and nutrient content of meals both within and between programs, the levels of nutrients provided typically fell well below adults’ requirements. Moreover, most programs did not serve food on a daily basis. These findings suggest that ad hoc, charitable food provisioning efforts have limited potential to meet the food and nutrition needs of homeless youth.

To be homeless in Canada is to lack the basic prerequisites for good health and be at increased risk for morbidity and mortality.^{3,4,26-37} Our study contributes to the growing body of literature on homelessness by documenting the extraordinary nutritional vulnerability of homeless youth and highlighting the urgent need for more effective interventions. To address this problem, more research could be undertaken to examine how to improve the nutritional quality of food served in charitable programs and the accessibility of these programs, or how to encourage homeless people to make better choices about the food they buy. However, we echo

the call of other researchers for a more complex, integrated, long-term strategy to address homelessness.^{38,39}

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RÉSUMÉ

Objectif : Expliquer les faibles apports de nutriments des jeunes sans abri de Toronto en examinant leurs rations alimentaires habituelles, les aliments qu'ils obtiennent de programmes caritatifs et les aliments qu'ils achètent eux-mêmes.

Méthode : Nous avons interviewé 261 jeunes sans abri (149 garçons, 112 filles) recrutés dans des lieux extérieurs et des centres d'accueil du centre-ville de Toronto. À partir des données de deux feuilles de rappel des aliments ingérés pendant les 24 dernières heures, nous avons estimé les rations alimentaires habituelles de ces jeunes et nous les avons comparées aux recommandations du Guide alimentaire canadien. Nous avons également comparé la qualité nutritionnelle des rations alimentaires que les jeunes obtiennent des programmes caritatifs de distribution de repas et des aliments qu'ils achètent.

Résultats : La ration alimentaire moyenne habituelle des garçons et des filles sans abri était très inférieure aux recommandations en vigueur pour les quatre groupes d'aliments et inférieure aux apports habituels des adultes (19 à 30 ans) dans la population générale. La journée choisie, les apports énergétiques moyens des jeunes étaient de $1\,962 \pm 1\,394$ kcal pour les filles et de $2\,163 \pm 1\,542$ kcal pour les garçons, et les calories consommées provenaient davantage du groupe des « autres aliments » que de tout autre groupe. Que ces jeunes se procurent leurs aliments de programmes caritatifs ou qu'ils les achètent eux-mêmes, leurs apports moyens provenant des quatre groupes d'aliments étaient très faibles, et la plupart des jeunes ne consommaient pas de céréales entières ni de légumes vert foncé ou orange (les aliments recommandés dans le Guide alimentaire canadien).

Conclusion : La faible qualité nutritionnelle des rations alimentaires des jeunes sans abri confirme la forte prévalence des carences nutritionnelles déjà observées dans cette population. Les stratégies actuelles des jeunes sans abri pour s'alimenter ne semblent pas répondre à leurs besoins nutritionnels.

Mots clés : jeunes sans abri; aliments; régime; analyse nutritionnelle

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Chief Charles Weasel Head
Blood Tribe

Paulette C. Tremblay, Ph.D.
*Chief Executive Officer
National Aboriginal Health Organization*

Phil Fontaine (Invited)
*National Chief
Assembly of First Nations*

2009 Program Highlights:

- New clinical initiatives in Aboriginal telemedicine
- Community updates on the Aboriginal Diabetes Initiative across Canada
- Collaborative mental health care in First Nation communities
- New health initiatives – Indigenous People Wellness Management System (Case Study)
- Provincial Aboriginal health care issues & initiatives: government panel presentations

Don't miss the opportunity to be part of the dialogue about strategies and solutions that promise better health for tomorrow.

Full conference agenda available at: www.insightinfo.com

An  incisivemedia event

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