Calorie Intake from Alcohol in Canada: Why New Labelling Requirements are Necessary

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ABSTRACT

We estimated calorie intake from alcohol in Canada, overall and by gender, age, and province, and provide evidence to advocate for mandatory alcohol labelling requirements. Annual per capita (aged 15+) alcohol sales data in litres of pure ethanol by beverage type were taken from Statistics Canada's CANSIM database and converted into calories. The apportionment of consumption by gender, age, and province was based on data from the Canadian Tobacco, Alcohol and Drug Survey. Estimated energy requirements (EER) were from Canada's Food Guide. The average drinker consumed 250 calories, or 11.2% of their daily EER in the form of alcohol, with men (13.3%) consuming a higher proportion of their EER from alcohol than women (8.2%). Drinkers consumed more than one-tenth of their EER from alcohol in all but one province. By beverage type, beer contributes 52.7% of all calories derived from alcohol, while wine (20.8%); spirits (19.8%); and ciders, coolers, and other alcohol (6.7%) also contribute substantially. The substantial caloric impact of alcoholic drinks in the Canadian diet suggests that the addition of caloric labelling on these drinks is a necessary step.

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RÉSUMÉ

Nous avons estimé l'apport en calories provenant de l'alcool au Canada, dans l'ensemble et selon le sexe, l'âge et la province, et proposons des données probantes en faveur de l'étiquetage obligatoire de l'alcool. Les données sur les ventes annuelles d'alcool par habitant (15 ans et plus) en litres d'éthanol pur par type de boisson ont été tirées de la base de données CANSIM de Statistique Canada puis converties en calories. La répartition de la consommation selon le sexe, l'âge et la province était fondée sur les données de l'Enquête canadienne sur le tabac, l'alcool et les drogues. Les besoins énergétiques estimés (BÉE) ont été tirés du Guide alimentaire canadien. Le buveur moyen consommait 250 calories, soit 11,2 % de ses BÉE quotidiens sous forme d'alcool; les hommes (13,3 %) consommant une plus grande proportion de leurs BÉE en alcool que les femmes (8,2 %). Les buveurs consommaient plus d'un dixième de leurs BÉE sous forme d'alcool dans toutes les provinces sauf une. Selon le type de boisson, la bière représente 52,7 % des calories provenant de l'alcool, tandis que, le vin (20,8 %), les spiritueux (19,8 %), et les cidres, panachés et autres alcools (6,7 %) y contribuent également de façon importante. L'impact calorique important des boissons alcoolisées dans le régime alimentaire canadien suggère qu'afficher la teneur calorique sur ces boissons est une étape nécessaire.

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INTRODUCTION

Drinking alcoholic beverages exerts a heavy medical, social, and economic toll in Canada; a recent comprehensive study estimated that alcohol caused 14 800 deaths and 87 900 hospitalizations and cost Canadian society $14.6 billion in 2014 [1]. In addition, Canada is experiencing a rapid increase in the proportion of its population who are overweight or obese, with adult obesity tripling in the period 1985 to 2011 [2] and youth obesity continuing to rise [3]. Research has suggested that alcohol consumption may contribute substantially to rising youth [3] and adult obesity rates [4]. Energy received from alcoholic beverages has been shown to add to, not replace, that from other dietary sources [5]. This results in energy overconsumption when using alcohol, which may suggest a link between drinking alcohol and caloric excess for both youth and adults. We note that the relationship between alcohol consumption and body mass is not completely understood because of the relationships between alcohol and a variety of other factors (e.g., stress, physical activity, and income); however, as alcohol is not an essential nutrient, those who might wish to reduce their caloric intake could do so without incurring nutritional deficits.

Alcohol, at 7 calories (i.e., kilocalories) per gram, is more calorie dense than either carbohydrates or protein (both 4 calories per gram), and only slightly less calorie dense than fat (9 calories per gram). However, many people are unaware of the calorie content of the alcoholic beverages they consume, which often contain calories from alcohol as well as from other ingredients such as sugar. This, coupled with the tendency for drinkers to underestimate their alcohol consumption, may magnify the low awareness of the calories consumed through alcoholic beverages in Canada.

The lack of mandatory information on alcohol labels in Canada perpetuates this problem. Specifically, there is no information about the number of standard drinks in an alcohol container or about the number of calories either in

the entire container or on a per standard drink (SD) basis. Research has shown that alcohol labelling may be a means to affecting consumer choice: a Canadian study found SD labelling significantly improved respondents' estimates of the amount of alcohol in a purchased container, while 69% believed this type of labelling would help them comply with Canada's Low Risk Drinking Guidelines (LRDG), i.e., 3 SD for men and 2 SDs for women daily [6, 7]. The same study showed 83% support for labelling the number of SDs in a container [6].

The objective of this study was to assess the percentage of recommended daily caloric intake (i.e., estimated energy requirements (EER)) received from alcoholic beverages among Canadians overall, and by gender, age, and province. We then discuss these findings in the context of public health arguments for the adoption of caloric labelling requirements on alcoholic drinks, such as consistent labelling across food and beverage categories and consumers' right-to-know.

METHODS

Per capita (ages 15+) alcohol sales in litres of pure alcohol per year were taken from Statistics Canada's CANSIM database [8], by beverage type, for Canada and the 10 provinces for fiscal year 2015–2016. These data were then adjusted upwards using a standard Canadian estimate of unrecorded consumption of 19.6% which accounts for additional alcohol consumed such as that made in make-your-own alcohol outlets (such as U-Brews and U-Vins) and homemade alcohol [9]. The result was the estimated provincial per capita consumption by 4 beverage types: (*i*) beer; (*ii*) wine; (*iii*) spirits; and (*iv*) ciders, coolers, and other alcohol (CCO). The resulting litres per capita by beverage type were converted to Canadian SDs per day; a Canadian SD is equivalent to the amount of pure alcohol in a 341 mL bottle of 5% beer by volume or 17.05 mL of ethanol [10].

For each beverage type, the average number of calories per SD was calculated using information taken from Health Canada's *Nutrient Value of Some Common Foods* publication [11], presented and modified in Table 1. Calories per SD was multiplied by SD per day for each beverage type and province to calculate the average number of calories consumed per day from alcohol. Note that calories are calculated based on alcohol as sold; for example, only the calories in spirits, such as vodka, gin, and rum, are included and not any nonalcoholic beverages that may be added after purchase, such as cola, juice, or tonic water. EER by gender and age group were taken from *Canada's Food Guide* [12] using the low active level of individual activity.

The average number of SDs consumed per day by gender were calculated using survey information for each province obtained from the Canadian Tobacco, Alcohol and Drug Survey provided by Statistics Canada [13] and maintained as a standard data set on alcohol exposure by the Canadian Institute for Substance Use Research (CISUR). Calories per day by gender were calculated using the same ratios, allowing us to arrive at calories per day for men, women, and the total drinking population (aged 15+). Lastly, the prevalence of drinking at least one SD in the past year was obtained from CISUR's data set for men, women, and total population by province. Calories per day were divided by prevalence of alcohol consumption to calculate daily calories consumed for the population of drinkers only.

RESULTS

Alcohol consumption among adult Canadians is high compared with the global average; the average Canadian consumes 1.6 SDs per day, against a global average of approximately one SD [14]. Among drinkers, Canadian men consume an average of 2.8 SDs per day and women 1.3 SDs per day. When translated to calories, overall the average Canadian aged 15+ years received 8.5% of their EER or 189 calories per day from alcohol (Table 2). The average Canadian drinker (15+ years) consumed 11.2% of their EER from alcohol (250 calories), including 13.3% (333 calories) among men and 8.2% (159 calories) among women. Of all calories consumed in alcohol by Canadians, beer contributed slightly more than half (52.7%), while wine (20.8%), spirits (19.8%), and CCO (6.7%) also contributed substantially.

Across provinces, an average drinker in Newfoundland and Labrador (NL) received the highest percentage (12.5%) of their EER from alcohol, while drinkers in all provinces except for New Brunswick (NB, 9.9%) consumed at least 10% of EER in the form of alcoholic beverages (Table 2). By province, men who drink get between 12.6% (NB and

Table 1. Caloric values of common alcoholic drinks and number of calories per standard drink (SD).

Beverage	Calories	mL	% alcohol by volume	mL alcohol	SD	Calories/SD
Beer	140	341	5.0	17.05	1.00	140.00
Red Wine	90	125	13.0	16.25	0.95	94.43
White Wine	85	125	11.5	14.38	0.84	100.82
Spirits	109	50	40.0	20.00	1.17	92.92
Cider, cooler, other	220	341	5.0	17.05	1.00	220.00

Source: Data from Health Canada, Nutrient Value of Some Common Foods [11, pg. 53].

Table 2. Average daily calories and percent of daily estimated energy requirements derived from alcoholic drinks among the population and among Canadian drinkers ages 15+.

	Among population 15+ y						Among drinkers 15+ y					
	Men		Women		Total		Men		Women		Total	
	cal	%EER	cal	%EER	cal	%EER	cal	%EER	cal	%EER	cal	%EER
Canada	267	10.7%	114	5.8%	189	8.5%	333	13.3%	159	8.2%	250	11.2%
Newfoundland and Labrador	284	11.4%	128	6.6%	204	9.2%	365	14.6%	185	9.5%	279	12.5%
Prince Edward Island	267	10.7%	109	5.6%	185	8.3%	345	13.8%	159	8.1%	254	11.4%
Nova Scotia	263	10.5%	104	5.3%	181	8.2%	337	13.5%	150	7.7%	247	11.1%
New Brunswick	245	9.8%	81	4.2%	162	7.3%	315	12.6%	118	6.1%	221	9.9%
Quebec	277	11.1%	116	6.0%	196	8.8%	325	13.0%	152	7.8%	242	10.9%
Ontario	259	10.4%	90	4.6%	173	7.8%	328	13.1%	129	6.6%	232	10.4%
Manitoba	256	10.3%	101	5.2%	182	8.2%	315	12.6%	140	7.2%	232	10.4%
Saskatchewan	276	11.1%	124	6.4%	209	9.4%	349	14.0%	177	9.1%	269	12.1%
Alberta	282	11.3%	131	6.7%	216	9.7%	352	14.1%	183	9.4%	273	12.3%
British Columbia	274	11.0%	121	6.2%	206	9.3%	338	13.5%	167	8.6%	256	11.5%

Note: cal, calories; %EER, percentage of daily estimated energy requirements.

Manitoba) and 14.6% (NL) of EER from alcoholic drinks, while for women those numbers range between 6.1% (NB) and 9.5% (NL).

Men drinking at the upper limit of Canada's LRDG [7] received 14.4% of their EER in the form of alcohol, while women received 12.3% from alcohol (Table 3). Men and women drinking at the threshold which defines a binge occasion (5 SDs for men, 4 SDs for women) received almost one quarter of their EER from alcohol (24.0% and 24.6%, respectively). This is especially critical as 25.8% of all adult Canadians report having at least one binge occasion in the past month [1]. Finally, heavy binge drinking occasions (10 SDs for men, 8 SDs for women) result in both men and women consuming almost half of their EER from alcohol. Since EERs decrease with age, these percentages are higher in older age groups and lower in younger age groups.

DISCUSSION

Our findings highlight the relatively high percentage of daily energy intake from alcohol in Canada. The average Canadian drinker receives 11.2% of their recommended daily calorie intake in the form of alcohol. Someone drinking at the upper level of the Canadian LRDGs would consume even more: 14.4% of recommended daily calories for males and 12.3% for females. This rises considerably during heavy binge drinking occasions when as much as half of EER is consumed in alcoholic beverages. Studies researching the effect of introducing caloric labelling on restaurant menus have shown large increases in calorie awareness [15] and, for those self-reporting calorie tracking, a decrease in calorie intake [16]. These findings lend strong support to the argument that alcohol containers be required to include information about: (*i*) the total number of calories per container, (*ii*) the number of Canadian SDs per container, and (*iii*) the number of calories per SD.

Many individuals wish to follow dietary guidelines to maintain a healthy body weight to prevent and/or manage serious health conditions such as diabetes, heart disease, and alcohol-related illnesses. At present, alcohol use disorders in Canada cause more hospital admissions than do heart attacks [17], and there is a national epidemic of obesity [2]. In this context, including information about alcohol content and calories should be considered a "right-to-know" consumer issue on a par with information required for other potential health hazards.

Furthermore, while most packaged food products and nonalcoholic beverages are required to provide detailed information about ingredients including usual serving sizes and calories, alcoholic beverages are exempt from these labelling requirements. This is an unfair advantage for alcohol products relative to other food and beverage products, especially given that alcohol is the most commonly used addictive drug in Canada [1]. In a democratic and educated society in which individual responsibility for health behaviours is emphasized,

Table 3. On drinking occasions with different levels of consumption, calories and percent of daily estimated energy requirements derived from alcoholic drinks among drinkers ages 15+ y, by gender and age group.

		Within LRDG		Minimum binge occasion		Heavy binge occasion	
	EER	kcal	%EER	kcal	%EER	kcal	%EER
Men age range, y							
19–30	2700	360	13.3%	600	22.2%	1200	44.4%
31–50	2600	360	13.8%	600	23.1%	1200	46.2%
51–70	2350	360	15.3%	600	25.5%	1200	51.1%
71+	2200	360	16.4%	600	27.3%	1200	54.5%
Total	2500	360	14.4%	600	24.0%	1200	48.0%
Women age range, y							
19–30	2100	240	11.4%	480	22.9%	960	45.7%
31–50	2000	240	12.0%	480	24.0%	960	48.0%
51–70	1850	240	13.0%	480	25.9%	960	51.9%
71+	1750	240	13.7%	480	27.4%	960	54.9%
Total	1950	240	12.3%	480	24.6%	960	49.2%

Note: %EER, percentage of daily estimated energy requirement; within LRDG, drinking within the daily Canadian Low Risk Drinking Guidelines (no more than 3 drinks for men and 2 drinks for women); minimum binge occasion, drinking the minimum number of daily drinks to constitute a binge occasion (5 drinks for men and 4 drinks for women); heavy binge occasion, drinking the number of daily drinks defining a heavy binge occasion (10 drinks for men and 8 drinks for women).

the failure to provide basic consumer information for decision making is questionable.

Labels on alcohol containers have the unique virtue of best reaching drinkers at point of purchase and are targeted to those who drink the most. Canadians have low levels of knowledge of the serious health risks from alcohol such as cancer, of their own national LRDGs, and even of the alcohol content of their favourite beverages [6]. Yukon is courageously trialing new alcohol labels, including warnings about the risk of alcohol-caused cancer, to remedy these knowledge deficits [18].

RELEVANCE TO PRACTICE

This study has identified that alcoholic beverages are a substantial contributor to calorie intake among Canadians who drink, providing an average of 11.2% of their EER from alcoholic drinks each day. Yet, almost uniquely among foods and beverages, alcoholic beverages are exempt from labelling calorie content. For Canadians to make informed decisions about diet and energy intake, they have a right to know about what they are eating and drinking.

From the perspective of clinical practice, providers should be aware that many Canadians drink excessively and may consume a large proportion of their calories from alcohol. Such information should be ascertained from patients and incorporated into treatment plans to reduce or prevent problems caused or exacerbated by caloric excess, alcohol consumption, or both.

Currently, new dietary guidance and nutrition policies are being considered as part of the Federal Government's Healthy Eating Strategy. One proposed change to *Canada's Food Guide* is to specifically point to sugar-sweetened beverages increasing the risk of obesity. Given the high prevalence of alcohol use in Canada, and the proportion of daily calories consumed through alcohol, it would be useful to highlight alcohol as a serious risk for increased caloric intake as well as serious health conditions such as cancer, liver cirrhosis, stroke, and heart disease [19]. Nutrition information and SD labels may be considered as part of a comprehensive approach to alcohol labelling. For example, it may increase public awareness of alcohol harms if a series of rotating messages are introduced with relevant, accurate information to convey both the health risks from alcohol consumption and details of Canada's LRDGs.

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