



## Excuses for Eating Chocolate Can Now Include Heart-Failure Prevention

Steve Stiles

August 17, 2010 (Dallas, Texas) — Not that many would need further encouragement to eat chocolate regularly, but a prospective observational study of older women in Sweden suggests that partaking of it up to a few times a week can cut the risk of heart failure by about a third [1]. Although many studies of various kinds have linked intake of chocolate, especially flavanol-rich dark chocolate, to improved blood pressure and other cardiovascular benefits, the new population-based study may be the first of its kind to suggest the confection can improve the risk of heart failure in particular.

The adjusted risk of heart failure over nine years declined 26% for women who reported a monthly chocolate intake of one to three servings and by 32% for those who said they ate one or two servings per week; both findings were significant. The analysis, based on >30 000 members of the **Swedish Mammography Cohort**, was controlled for intake of other foods, body-mass index, exercise levels, family medical history, and other potential influences on heart-failure risk.

But women who reported eating chocolate more often than twice a week didn't show a reduced heart-failure risk. "Chocolate still comes with a fair amount of calories from sugar and fat, which can be problematic," observed senior author **Dr Murray A Mittleman** (Beth Israel Deaconess Medical Center, Boston MA). "We controlled for total calorie intake, so that means for women who were eating larger amounts of chocolate, it was displacing other foods that might be beneficial, such as fruits and vegetables," he told **heartwire**.

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"We think the data are suggesting that if you're going to have a treat, chocolate is a reasonable choice because it appears to have these beneficial effects, [as long as] you are careful not to overindulge." His group's report, with first author **Elizabeth Mostofsky** (Beth Israel Deaconess Medical Center), is published online August 17, 2010 in *Circulation: Heart Failure*.

Of course, any benefits depend on the type of chocolate. The flavanols in chocolate believed to confer cardiovascular benefits are concentrated in the cocoa solids (pure chocolate minus the cocoa butter)--so the greater the cocoa content, the better are chocolate's health effects. Overwhelmingly, according to Mittleman, the chocolate consumed in Sweden is milk chocolate, but in accordance with European standards, its cocoa content is likely to be about 30%. It can therefore be richer in flavanols than some dark chocolate in the US, which is allowed to contain as little as 15% cocoa solids.

The analysis included 31 823 women the Swedish cohort who were 48 to 83 years old at baseline without a history of diabetes, myocardial infarction (MI), or heart failure who completed questionnaires on intake of specific foods, activity levels, body dimensions, and

other issues. Over nine years of follow-up, the rate of hospitalization or death from heart failure was 15.1 cases per 10 000 person-years.

In a finding that mirrors other research, the adjusted heart-failure event hazard ratio (HR) associated with chocolate intake at various levels showed a J-shaped trend that was significant at  $p=0.0005$ , with risk falling off significantly in association with either one or two servings per week or one to three servings per month, compared with no regular intake. Risk was neither up or down significantly at higher consumption levels.

### **Hazard Ratio (95% CI) for Heart Failure Death or Hospitalization by Chocolate Consumption Over Nine Years, Compared to No Regular Chocolate Intake, in the Swedish Mammography Cohort**

<b>Frequency of chocolate intake</b>	<b>HR (95% CI)*</b>
<b>1 to 3 servings/mo</b>	0.74 (0.58–0.95)
<b>1 to 2 servings/wk</b>	0.68 (0.50–0.93)
<b>3–6 servings/wk</b>	1.09 (0.74–1.62)
<b>≥1 servings/d</b>	1.23 (0.73–2.08)

\* $p$  for quadratic trend 0.0005

"The [caveat] with this kind of study, of course, is that it's observational," Mittleman acknowledged. "It was a prospective cohort study, whereas a number of the short-term studies [showing chocolate effects] on blood pressure were randomized. Having said that, we were able to adjust for a lot of things, like exercise and diet," he said.

"There are data that show the effect of chocolate on blood pressure and other vascular markers are similar in men and women, so there's no strong reason to believe the effects [seen in this study] would be any different in men," according to Mittleman. "[However,] it would be important to get the data in men to be certain."

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### **References**

1. Mostofsky E, Levitan EB, Wolk A, Mittleman MA. Chocolate intake and incidence of heart failure: A population-based, prospective study of middle-aged and elderly women. *Circ Heart Fail* 2010; DOI:10.1161/CIRCHEARTFAILURE.110.944025. Available at: <http://circheartfailure.ahajournals.org>.