



## CONCLUSIONS

**Dietary patterns characterized by lower meat intake were associated with a more favorable profile of metabolic risk factors**  
**The greatest beneficial associations were seen in waist circumference, blood pressure and fasting glucose levels**  
**The risk of having the MetS was lowest for subjects with the least intake of animal derived foods**

### BACKGROUND

Currently it is estimated that there are 180 million cases of type 2 diabetes worldwide. This burden will likely become worse considering the increasing proportion of those that meet the criteria for the MetS. In the US 27% of the population suffer of the MetS. In view of the rapid increase of MetS and the associated health consequences there is a pressing need to identify dietary and other lifestyle patterns that may be effective in the prevention of the disease.

### PURPOSE

To investigate associations between dietary patterns categorized by degree of meat, dairy and egg intake with the MetS and component factors of the MetS.

### METHODS

Cross-sectional analysis of 1356 subjects (mean age 63.1 years) with a complete set of clinical and dietary data from two clinical sub studies of the Adventist Health Study II. Dietary intake was obtained using a previously validated quantitative, self-administered food-frequency questionnaire (FFQ), a comprehensive instrument consisting of 204 foods with additional 46 fields for open-ended questions. Dietary pattern was categorized based on the FFQ and classified as non vegetarian (consuming red meat, poultry and fish >1 time/week), semi vegetarian (consuming dairy products and/or eggs and fish or meat ≥1 time/month and <1 time/week), pesco vegetarian (consuming fish ≥1 time/month with no restrictions on dairy products and/or eggs but consuming red meat or poultry <1 time/month), lacto-ovo vegetarian (consuming meat, poultry or fish <1/month but with no restrictions on consuming eggs and or dairy products) and strict vegetarian (consuming no animal products (red meat, poultry, fish) and consumed eggs, milk, and dairy products <1 time/month). Logistic regression analysis was used to calculate odds ratios (OR) and 95% confidence intervals (CI) for the association of dietary patterns with metabolic risk factors and MetS. Non vegetarian dietary pattern was the group of reference. Risk factors included waist circumference, blood pressure, glucose, triglycerides and HDL. MetS was defined by the Adult Treatment Panel III with subjects having three or more risk factors over the defined threshold meeting the criteria of MetS (Waist circumference: men >102 cm, women >88 cm; triglycerides: ≥150 mg/dl; HDL: men <40 mg/dL, women <50 mg/dL; systolic BP (blood pressure): ≥130 mmHG; diastolic BP (blood pressure): ≥85 mmHG; glucose ≥110 mmHG). All analyses were adjusted for relevant confounding factors.

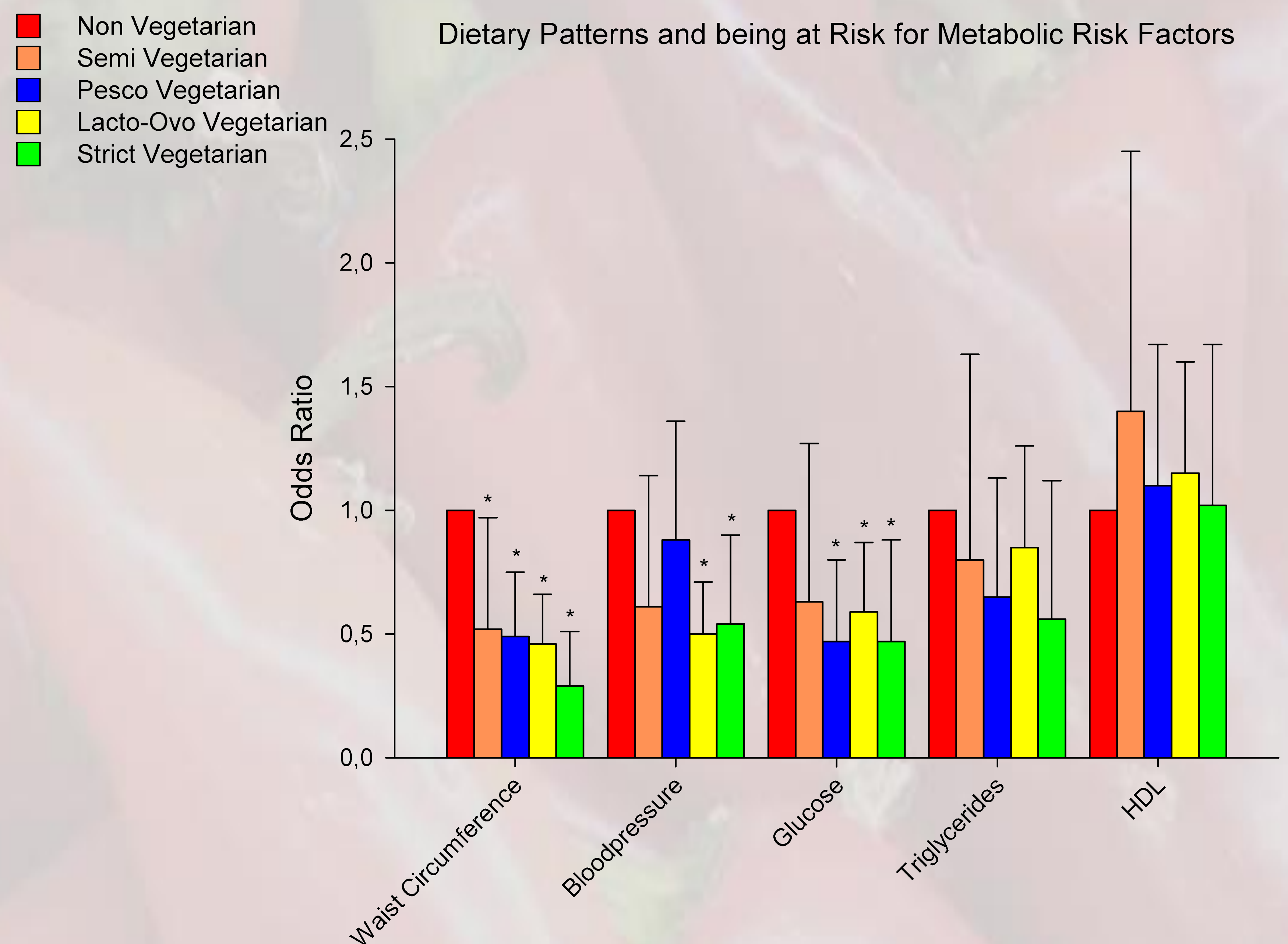
### BASIC CHARACTERISTICS

	All	Non Vegetarian (n=490)	Semi Vegetarian (n=124)	Pesco Vegetarian (n=52)	Lacto-Ovo Vegetarian (n=303)	Strict Vegetarian (n=87)	P
<b>Age Group</b>							<b>&lt;0.001</b>
30 – 54.9	30.1	35.9	29.0	11.5	25.1	27.6	
55 – 69.9	37.8	39.2	40.3	38.5	34.3	37.9	
≥ 70	32.1	24.9	30.6	50.0	40.6	34.5	
<b>Sex</b>							0.805
Female	63.4	63.1	61.3	71.2	63.7	63.2	
Male	36.6	36.9	38.7	28.8	36.3	36.8	
<b>Race</b>							<b>&lt;0.001</b>
Non Black	59.0	45.7	50.0	75.0	82.2	56.3	
Black	41.0	54.3	50.0	25.9	17.8	43.7	
<b>Education</b>							<b>&lt;0.001</b>
High School or less	19.2	23.5	18.5	17.3	12.2	21.8	
Some College	56.0	60.0	57.3	61.5	49.2	51.7	
MA and PhD	24.8	16.5	24.2	21.2	38.6	26.4	
<b>MV Physical Activity</b>							0.015
< 45 min/day	58.9	53.9	66.9	59.6	64.4	56.3	
≥ 45 min/day	41.1	46.1	33.1	40.4	35.6	43.7	
<b>TV watching</b>							<b>&lt;0.001</b>
<2 hr/day	41.4	27.1	39.8	36.5	39.8	69.4	
>2 hrs/day	58.6	72.9	60.2	63.5	60.2	30.6	
<b>Alcohol</b>							<b>&lt;0.001</b>
Never used Alcohol	63.6	51.4	66.1	69.2	79.5	70.1	
Used Alcohol	32.3	48.6	33.9	30.8	20.5	29.9	
<b>Smoking</b>							<b>&lt;0.001</b>
Never used Tobacco	83.7	78.0	84.7	82.7	91.7	87.4	
Used Tobacco	15.5	22.0	15.3	17.3	8.3	12.6	

Percentages of risk and lifestyle factors. Chi-square test was used in the analysis and P for trend is reported.

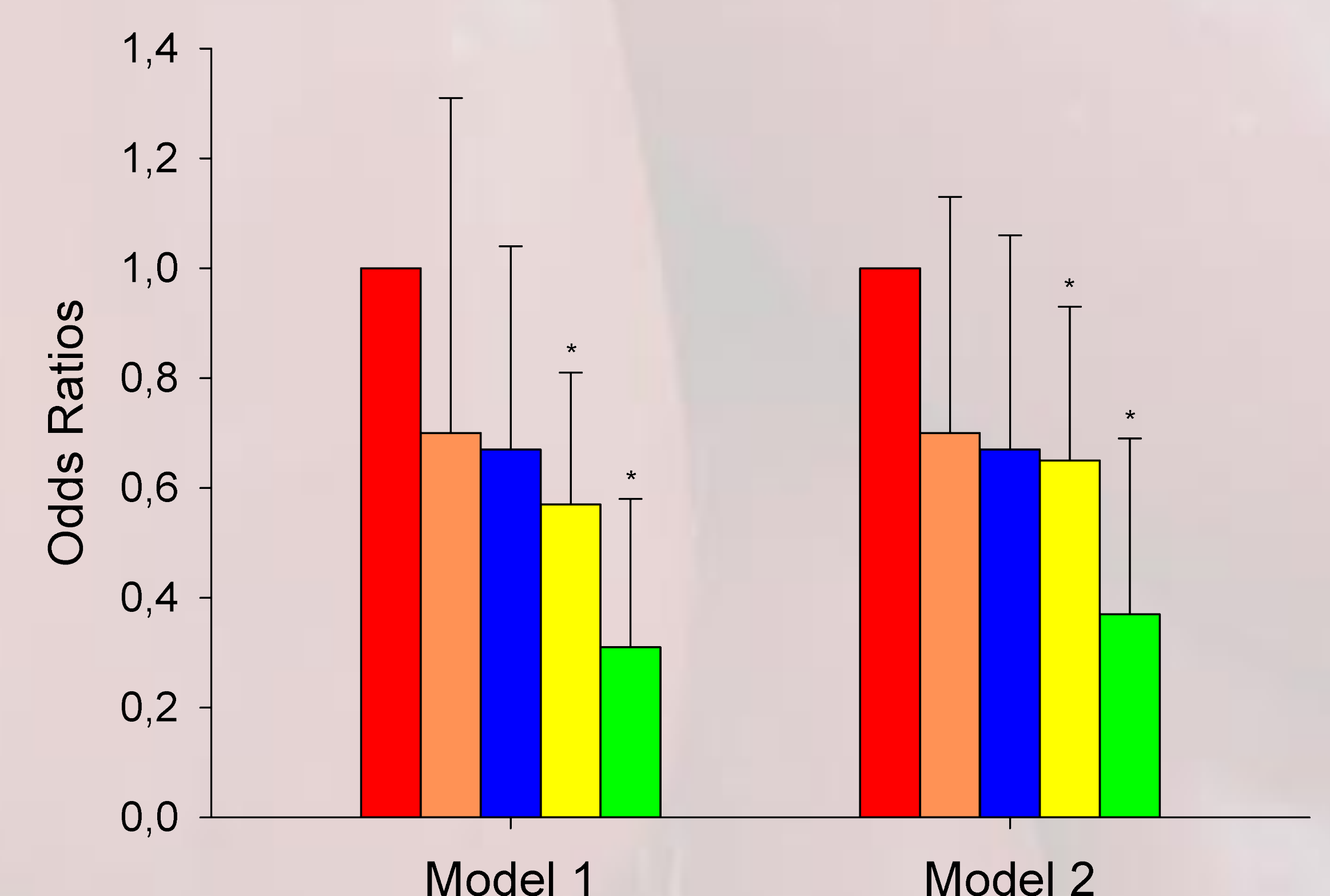
## RESULTS

Dietary Patterns and being at Risk for Metabolic Risk Factors



Odds ratios (OR) for each of the component metabolic risk factors are represented. Non vegetarians were the group of reference. All analyses were adjusted for sex, age, ethnicity, educational status, physical activity, TV viewing, tobacco use, alcohol intake and total dietary energy intake. Whiskers denominate CI with asterisks representing P values <0.05 when compared to the group of reference.

Dietary Patterns and Risk of Metabolic Syndrome



Model 1 shows the odds ratios for being at risk of the MetS after adjusting for age, sex and ethnicity. Model 2 additionally adjusts for educational status, physical activity, TV viewing, tobacco use, alcohol intake and total dietary energy intake. Non vegetarian dietary pattern were the group of reference. Whiskers denominate CI with asterisks representing P values <0.05 when compared to the group of reference.

