

# Comparison of the olfactory perception of vegetarians, vegans and omnivores

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## Introduction

The vegetarian and vegan diet significantly differs from that of omnivores and can lead to nutrient's deficits such as cobalamin (Vitamin B12). The fact that the vitamin B12 deficiency correlates with the appearance of neurological disorders suggests that the lack of this vitamin in the body may affect the olfactory function in a negative way. Therefore, it was interesting to investigate the olfactory perception of vegetarians and vegans compared to omnivores.

## Methods

For the study 187 study participants aged 18 to 46 years were selected and divided into three groups: the control group (n=70 omnivores; 40 women, 30 men), as well as two investigated groups: vegans (n=61; 33 women, 28 men) and vegetarians (n=56; 30 women, 26 men) (Tab. 1). The individuals were evaluated by applying the "Sniffin'Sticks" odor threshold (T), discrimination (D), and identification (I) test (Fig.1). Additionally, to assess the olfactory function, the TDI-Score was calculated.

## Results

The TDI-Score as well as the results of the odor threshold test revealed significant differences ( $p \leq 0.05$ ) between all three evaluated groups (Fig. 5 and 2). The results of odor discrimination showed significant differences ( $p \leq 0.05$ ) between vegans and omnivores (Tab. 3). The odor identification test indicated significant differences ( $p \leq 0.05$ ) between vegans and vegetarians as well as between vegans and omnivores (Tab.4). In addition, no significant correlation ( $p > 0.05$ ) could be found between the duration of the vegan or vegetarian diet and results of the three conducted odor tests as well as the TDI-Score.

## Conclusion

Generally, vegans in contrast to vegetarians and omnivores achieved the lowest scores in all three conducted odor tests and consequently, the lowest TDI-Score, which was in slightly hyposmic range. Therefore, a possible negative impact of vegan diet on the olfactory perception in human should be investigated in the future research.

Group	Evaluated subjects	Gender	Ø Age
Vegans	61	33 women 28 men	28.31±7.46
Vegetarians	56	30 women 26 men	25.48±5.61
Omnivores	70	40 women 30 men	25.21±5.35

Tab.1: Characteristic of the subjects (age and gender distribution)

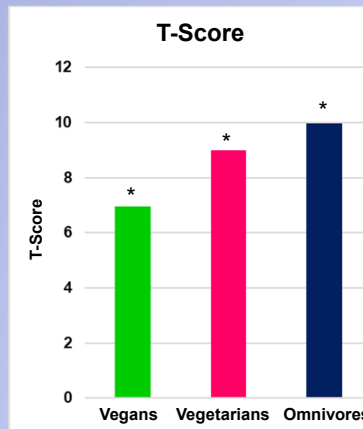


Fig.2: Results of the odour threshold test

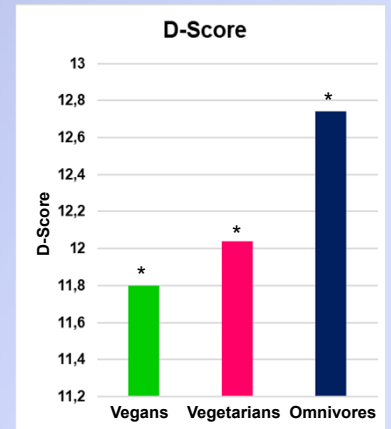


Fig.3: Correctly discriminated odours

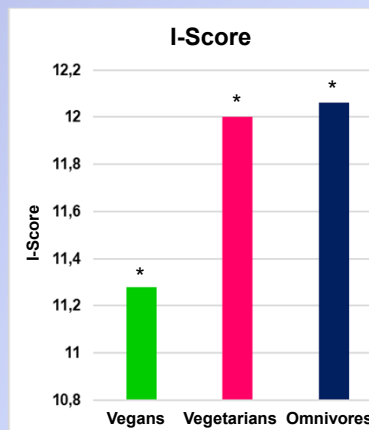


Fig.4: Correctly identified odours

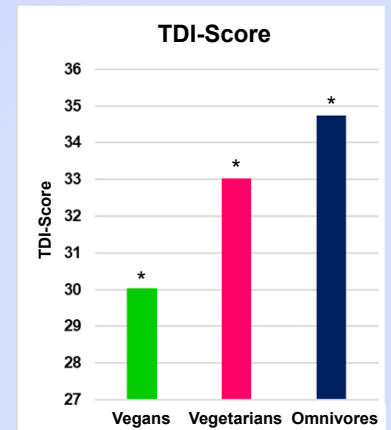


Fig.5: TDI-Score

Evaluated groups	T-Score (mean±SD)	D-Score (mean±SD)	I-Score (mean±SD)	TDI-Score (mean±SD)
Vegans	6.96±2.49	11.80±1.64	11.28±1.40	30.04±3.60
Vegetarians	9.00±2.23	12.04±1.96	12.00±1.78	33.03±3.61
Omnivores	9.96±2.03	12.73±1.46	12.06±1.82	34.74±3.60
Reference Values	9.45±0.9	12.35±1.5	14.70±1.2	> 30

Tab 2: Comparison of the olfactory test results between the evaluated groups (mean ± SD)



Fig.1: Sniffin' Sticks