New Zealand blackcurrant powder reduces a human body odor component in middle-aged and older adults

Mark Willems¹, Michihito Todaka², Matthew Cook³, Yoshika Sekine⁴

¹Institute of Sport, University of Chichester, United Kingdom
²Graduate School of Science, Tokai University, Japan
³School of Sport and Exercise Science, University of Worcester, United Kingdom
⁴m.willems@chi.ac.uk

INTRODUCTION
Age-induced body odor is associated with emission of the skin gases 2-nonenal (Haze et al., 2001) and diacetyl. Diacetyl is produced from L-lactate in sweat by bacterial activity. Higher emission of 2-nonenal in older people results from oxidative stress-induced lipid peroxidation of fatty acids (Ishino et al., 2010) in sebaceous glands potentially by declined antioxidant defences. Blackcurrant has antioxidant effects.

AIM
We examined primarily whether New Zealand blackcurrant (NZBC) powder decreased the emission of 2-nonenal in older adults.

METHODS
Fourteen middle aged and older adults (9 males, age: 55±5 yr, mean±SD, range 49-64 yr) volunteered. Participants consumed NZBC powder for 7 days (Sujon Berries, Nelson, New Zealand, 6 g·day⁻¹ with 138.6 mg anthocyanin, 49 mg Vit C, 5.2 g of carbohydrates and total phenolic content of 271.6 mg per serving).

Two hours after the last intake, a passive flux sampler (Kimura et al., 2016) was applied to the skin in the base of the neck for one hour. Participants did not use hot water or soap for 48 hrs on the skin sampling location.

The sampler consists of a polypropylene screw cap with trapping media (MonoTrap®, DCC18, GL Science, Japan) and gas chromatography-mass spectrometry was used for media analysis of 2-nonenal and diacetyl (Kimura et al., 2016). Dietary anthocyanin intake was quantified by analysis of a food frequency questionnaire and anthocyanin information on http://phenol-explorer.eu/.

RESULTS

**Emission flux of diacetyl** (ng·cm⁻²·hr⁻¹)

<table>
<thead>
<tr>
<th></th>
<th>control</th>
<th>NZBC powder</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.0±0.5</td>
<td>2.0±0.5</td>
</tr>
</tbody>
</table>

**New Zealand blackcurrant powder had no effect on skin emission of diacetyl.**

**Emission flux of 2-nonenal** (ng·cm⁻²·hr⁻¹)

<table>
<thead>
<tr>
<th></th>
<th>control</th>
<th>NZBC powder</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5.0±1.0</td>
<td>5.0±1.0</td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>

**New Zealand blackcurrant powder reduced skin emission of 2-nonenal in older adults by 28% (two-tailed Mann-Whitney, P=0.01).**

**Baseline 2-nonenal values were not significantly correlated with dietary anthocyanin intake.**

**The % decreases in 2-nonenal with intake of NZBC powder were not significantly correlated with dietary anthocyanin intake.**

CONCLUSIONS
Seven day intake of New Zealand blackcurrant powder seems to be able to reduce body odor in older adults. Future work may address the potential of blackcurrant to reduce lipid peroxidation in human cells and affecting cell biology and human health.

REFERENCES

ACKNOWLEDGEMENT
Special thanks to Bill Floyd (Japan Blackcurrant Association) for project conception. We thank Sujon Berries (Nelson, New Zealand) for supplements and Blackcurrant New Zealand Inc. for support for conference attendance.