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The effect of dietary modifications on cortisol secretion
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Background – Cortisol is a key hormone in the response to stress, and depression, anxiety and stress are associated with increased daily cortisol secretion. Dietary factors may influence daily cortisol secretion.

Objective – To assess the effect on cortisol secretion of two diets: a high-calcium diet, rich in low-fat dairy foods (HC) and a low-sodium, high-potassium diet, rich in fruits and vegetables (LNAHK) with a moderate-sodium, high-potassium, high-calcium “DASH” type diet, high in fruits, vegetables and low-fat dairy foods (OD).

Design - In a crossover design, subjects were randomised to two test diets for 4- wk, the OD and either HC or LNAHK, each preceded by a 2 wk control diet (CD). Saliva samples were collected in the morning and at 1200 h, 1600 h, 2000 h for 1 d at the end of each diet.

Outcomes – Seventy-four subjects completed the study (29 men, 45 women) with a mean (SD) age of 56.3(9.8) yr and a mean BMI of 29.2(3.8) kg/m². Cortisol variability was high for morning samples (176% CV); however, afternoon/evening samples (area under the curve (AUC) (nmol.1¹.8hr⁻¹)) had less variation (30% CV). CD cortisol concentrations predicted the change in AUC: for the OD β=-0.8(0.1) (SEM), LNAHK β=-0.7(0.1) and HC β=-0.7(0.1) (R²: 0.4-0.6). The % change in AUC was lower in the HC diet when compared to the OD diet (P=0.058), and significantly lower when compared to the LNAHK diet (P<0.05).

<table>
<thead>
<tr>
<th></th>
<th>OD diet¹ (n=50)</th>
<th>LNAHK diet (n=32)</th>
<th>HC diet¹ (n=29)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD cortisol AUC (nmol.1¹.8hr⁻¹)</td>
<td>1.9 ± 0.1</td>
<td>2.1 ± 0.2</td>
<td>1.9 ± 0.2</td>
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<tr>
<td>% change (diet period – control period)</td>
<td>16.8 ± 8.9</td>
<td>19.0 ± 8.4</td>
<td>-3.5 ± 5.7</td>
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</table>

¹mean ± SEM

Conclusion – Consumption of 3-4 serves/day of dairy foods resulted in a fall in cortisol secretion compared to a rise seen in two diets requiring some dietary restrictions. This suggests increased dairy intake may have beneficial effects on cortisol secretion in the afternoon/evening period.