Pinch too Far?
The Science behind Low-Salt Cuisine
Join award-winning chef and the BBC's 'The Great British Menu' participant Stephanie Moon and Warwick's Professor Franco Cappuccio for this unique collaboration as they explore why salt can be bad for our health and demonstrate just how delicious meals are with no added salt. BBC Correspondent David Gregory-Kumar joins them for the occasion!

As an adult you need less than 1g of salt a day but as a nation we are, on average, consuming eight times this amount!
Pinch too Far?
The Science behind Low-Salt Cuisine

Stephanie Moon
David Gregory-Kumar
Franco Cappuccio
THE ‘THREE’ IN ACTION
SMOKED KLINSEY TROUT SERVED ON A CELERIAC REMOULADE WITH SALAD LEAVES AND LEMON DRESSING
PREPARING SMOKED KLINSEY TROUT!
### Nutritional information

<table>
<thead>
<tr>
<th></th>
<th>Sodium* (mg)</th>
<th>Salt^ (g)</th>
<th>Potassium*# (mg)</th>
<th>Sodium/Potassium¶</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total recipe</td>
<td>532</td>
<td>1.33</td>
<td>3509</td>
<td>0.15</td>
</tr>
<tr>
<td>per 100g</td>
<td>89</td>
<td>0.22</td>
<td>585</td>
<td>0.15</td>
</tr>
</tbody>
</table>

Traffic light coding derived from the Department of Health Guide to creating a front of pack (FoP) nutrition label for pre-packed products sold through retail outlets (2013).
* Nutritional content derived from McCance & Widdowson’s Composition of Food Integrated Dataset.
^ Salt derived by multiplying sodium (g) by 2.5
# Potassium currently not included in the FoP coding.
¶ Sodium/Potassium should be 1 or less.
SOME FACTS ABOUT THE HISTORY OF SALT

Salt through civilization
Evolutionary diet
No-one has ‘normal’ salt consumption
Women sprinkling salt on their husbands ...
A slave trader licking a slave’s face ....
Market ‘mummies’ in Ghana ...
SALT THROUGH CIVILIZATIONS

- Divine and preservative properties
- Evil spirits and luck
- Hospitality
- Essence
- Medical use
- Fertility
- Religion

- Commercial and fiscal article
  - China (~2,000 BC – to increase revenue)
  - Old Testament (Sodom & Gomorrah – industrial salt production)
  - Roman Empire (‘salary’)
  - Venice (4th-12th c – world salt supplier)
  - Hanseatic League (15th c – salt supplier in Northern Europe)
  - France and la Gabelle (tax on salt)
  - Central Italy (tax on salt – ‘Tuscany bread’)
  - Hapsburg Empire (17th c – tax monopoly on salt)
  - India (salt duty)
  - England and the US (unsuccessful salt taxes)
  - War (salt as cause of wars)
EVOLUTIONARY DIET

• Profound changes in the composition of human diet with the introduction of agriculture and animal husbandry ~10,000 years ago

• Salt: necessity for life – first international commodity of trade – great symbolic importance and economic value – first state monopoly – property of preserving foods from decay – enhancing flavours fulfilling hedonic reward

• Evolutionary diet: estimated intake for sodium ~10mmol/d and for potassium ~200mmol/d (ratio ~0.05)

• Modern diet: measured intake for sodium ~170mmol/d and for potassium ~60mmol/d (ratio ~2.5)

NO ONE HAS ‘NORMAL’ SALT CONSUMPTION

- Salt was scarce for most hominid evolution
- First manufactured 6,000 years ago
- Mass produced for only a few hundred years

Yanomamo Indian

- On ‘evolutionary’ diet (i.e. almost no salt [<1 g/day], very little fat, no refined carbohydrate, fruits & vegetables ↑↑, but aggressive fit, stress ↑↑↑)
- No high BP, no rise in BP with age, no adverse health consequences, no vascular disease
- Male adults: BP: 96 / 61 mmHg
  Cholesterol: 3.1 mmol/L

from Cappuccio FP & Capewell S. Functional Food Rev 2015; 7: 41-61
‘WOMEN SPRINKLING SALT ON THEIR HUSBANDS .... TO STIMULATE THEIR SEXUAL PERFORMANCE’
A slave trader licking a slave’s face ....
to assess his fitness for the voyage across the Atlantic
Market mummies selling salted smoked fish in Ghana
SPICED MOROCCAN BEEF MEAT BALLS
WITH ROASTED PEPPERS & HOMEMADE FLAT BREAD

Stephanie Moon ©
PREPARING SPICED MOROCCAN MEATBALLS!
**Nutritional information**

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<th>Salt^ (g)</th>
<th>Potassium*# (mg)</th>
<th>Sodium/Potassium¶</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total recipe</td>
<td>1451</td>
<td>3.63</td>
<td>7518</td>
<td>0.19</td>
</tr>
<tr>
<td>per 100g</td>
<td>242</td>
<td>0.61</td>
<td>1253</td>
<td>0.19</td>
</tr>
</tbody>
</table>

CHO=Carbohydrates  
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Salt ... is salt!
Where in our diet does salt come from?
A gradual reduction in salt is not detected
How much salt should we eat?
What does ‘too much’ look like?
Health benefits of a moderate salt reduction
Who owns what in the food industry?
Dietary salt and the ‘cycles of profit’
TYPES OF SALT:
ALL CONTAINING PREDOMINANTLY SODIUM CHLORIDE

- Black salt (Kala namak)
- Celtic salt
- Coarse salt
- Flake salt
- Fleur de Sel
- French Sea salt
- Grey salt
- Grinder salt
- Hawaiian Sea salt (Alaea)
- Himalayan Pink salt
- Italian Sea salt
- Kosher salt
- Organic salt
- Sea salt
- Smoked Sea salt
WHERE IN OUR DIET DOES SALT COME FROM?

- 12% Occurs Naturally in Foods
- 11% Added at the Table or in Cooking
- 77% Restaurant/Processed Food

In regions where most food is processed or eaten in restaurants.
A gradual reduction in the salt content of food is not detected by consumers!

**SALT = Sodium Chloride = NaCl**

2.5 grams of SALT contain 1.0 gram of SODIUM

How much salt should we and how much we do eat?

<table>
<thead>
<tr>
<th>ADULTS</th>
<th>TARGET</th>
<th>CURRENT CONSUMPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>6 g salt per day or less</td>
<td>8.1 g salt per day</td>
</tr>
<tr>
<td>Men</td>
<td>6 g salt per day or less</td>
<td>9.3 g salt per day</td>
</tr>
<tr>
<td>Women</td>
<td>6 g salt per day or less</td>
<td>6.8 g salt per day</td>
</tr>
</tbody>
</table>

How much is too much in food (per 100g)?

<table>
<thead>
<tr>
<th></th>
<th>LOW</th>
<th>MEDIUM</th>
<th>HIGH</th>
</tr>
</thead>
<tbody>
<tr>
<td>SALT</td>
<td>0 – 0.3 g</td>
<td>0.3 – 1.5 g</td>
<td>More than 1.5 g</td>
</tr>
<tr>
<td>SODIUM</td>
<td>0 – 0.1 g</td>
<td>0.1 – 0.6 g</td>
<td>More than 0.6 g</td>
</tr>
</tbody>
</table>
REDUCES High blood pressure
PREVENTS Stroke
PREVENTS Heart disease
REDUCES Fluid retention, albumin and calcium excretion
PREVENTS High parathyroid hormone
REDUCES Bone mineral loss and osteoporosis
MAY REDUCE Stomach cancer
MAY REDUCE Cataract

EFFECTS OF A MODERATE REDUCTION IN SALT INTAKE
The world’s 10 largest food and non-alcoholic beverage companies feed daily an estimated global population of several hundred million in >200 countries, generating a combined annual revenue of >$422b” (Source: IFBA, 2012)
Dietary salt and the ‘Cycles of profit’

Food & Beverage Industry
(promotion and production)

Highly salted processed food
70-80% of daily salt intake

Salt addiction
Taste buds down regulation
Demand for salty foods

High Salt Intake

Meat products
Water binding

Weight no cost

C

Mineral water
Soft drinks

Thirst

Profit

Obesity

High calorie intake

A

B

C

D

Cappuccio FP & Capewell S. Functional Food Rev 2015; 7: 41-61
HAVING FUN!
FINAL SUCCESS!