



FESTIVAL OF THE
IMAGINATION
FRIDAY 16 - SATURDAY 17 OCTOBER 2015

University of Warwick

Pinch too Far? The Science behind Low-Salt Cuisine

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!

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!

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**

Stephanie Moon ©



PREPARING SMOKED KLINSEY TROUT!



SMOKED KLINSEY TROUT SERVED ON A CELERIAC REMOULADE WITH SALAD LEAVES AND LEMON DRESSING

Stephanie Moon ©

Nutritional information

	Sodium* (mg)	Salt^ (g)	Potassium*# (mg)	Sodium/ Potassium¶
Total recipe	532	1.33	3509	0.15
per 100g	89	0.22	585	0.15

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

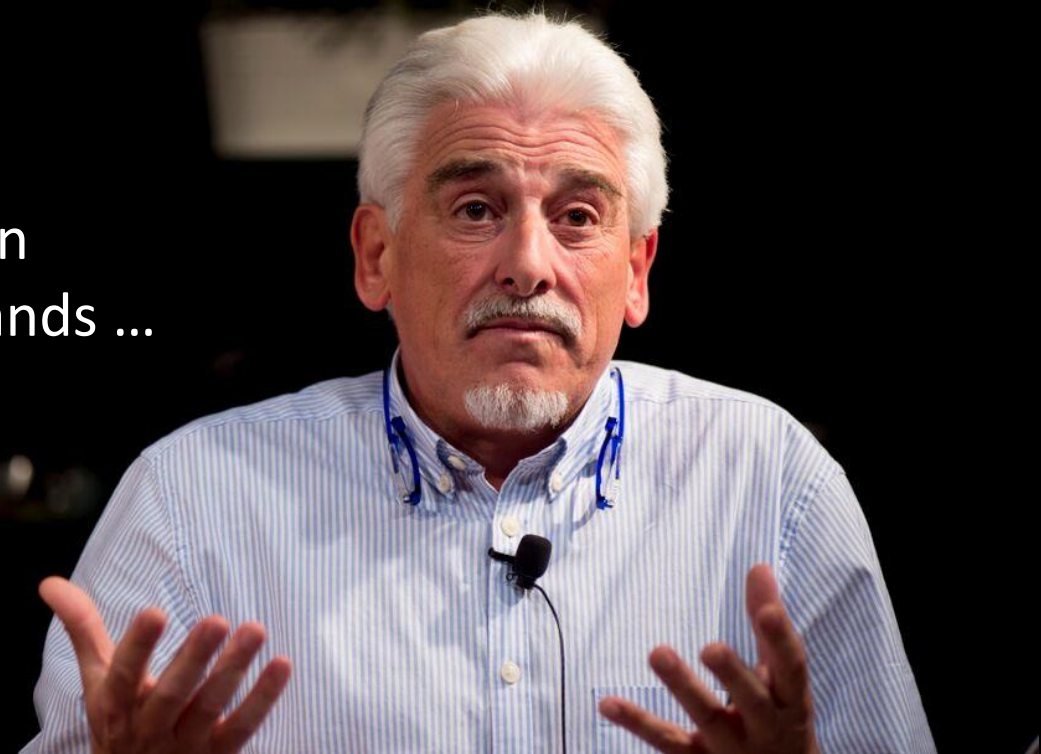
Evolutionary diet

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)

Eaton SB et al. Am J Med 1988; 84: 739-49

Cordain L et al. Am J Clin Nutr 2005; 81: 341-54

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 $\uparrow\uparrow$, but aggressive fit, stress $\uparrow\uparrow\uparrow$)
- 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

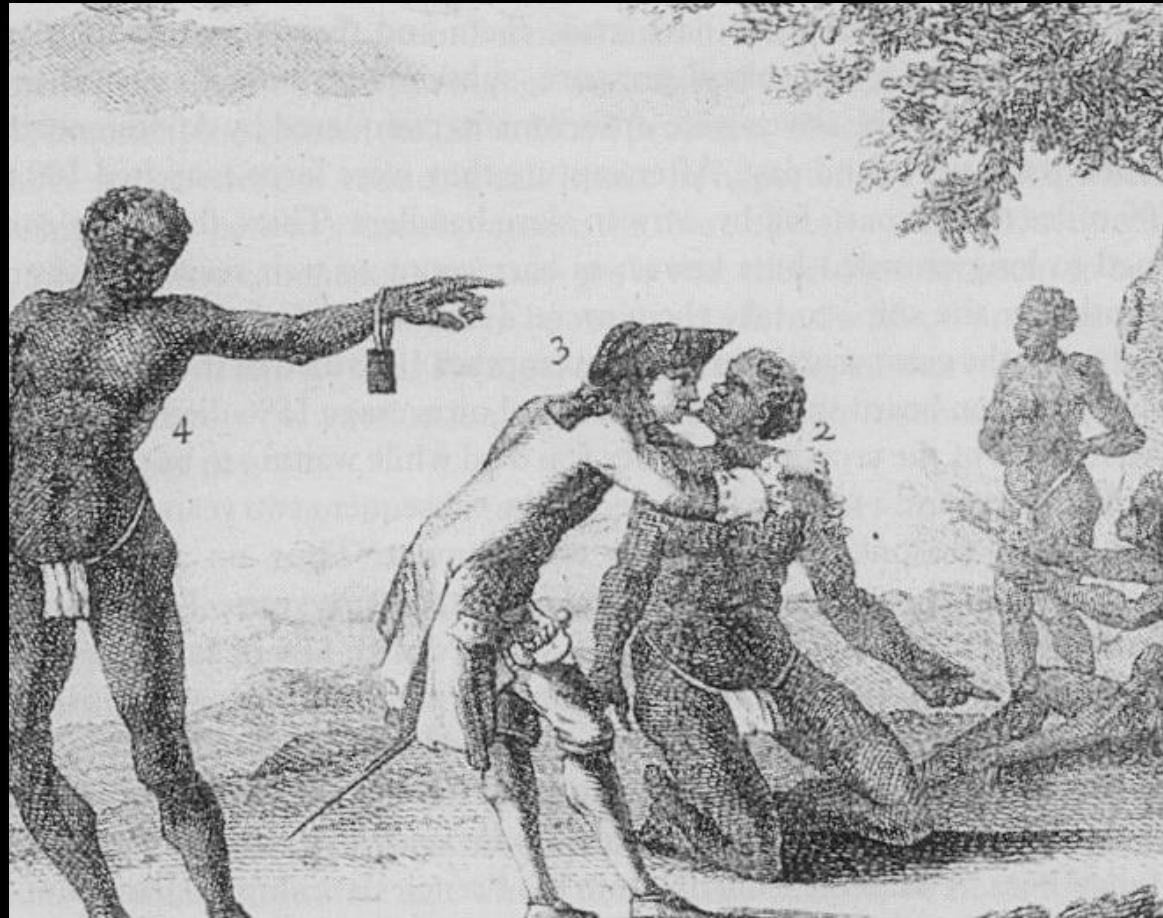


**'WOMEN SPRINKLING SALT ON THEIR HUSBANDS ...
TO STIMULATE THEIR SEXUAL PERFORMANCE'**



*Anonymous
woodcut*

*A slave trader licking a slave's face
to assess his fitness for the voyage across the Atlantic*



Copper engraving, 1764

Market mummies selling salted smoked fish in Ghana



SPICED MOROCCAN BEEF MEAT BALLS WITH ROASTED PEPPERS & HOMEMADE FLAT BREAD

Stephanie Moon ©



PREPARING SPICED MOROCCON MEATBALLS!



SPICED MOROCCAN BEEF MEAT BALLS WITH ROASTED PEPPERS & HOMEMADE FLAT BREAD

Stephanie Moon ©

Nutritional information

	Sodium* (mg)	Salt^ (g)	Potassium*# (mg)	Sodium/ Potassium¶
Total recipe	1451	3.63	7518	0.19
per 100g	242	0.61	1253	0.19

CHO=Carbohydrates

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).

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MORE FACTS AND SOME SCIENCE ABOUT SALT

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



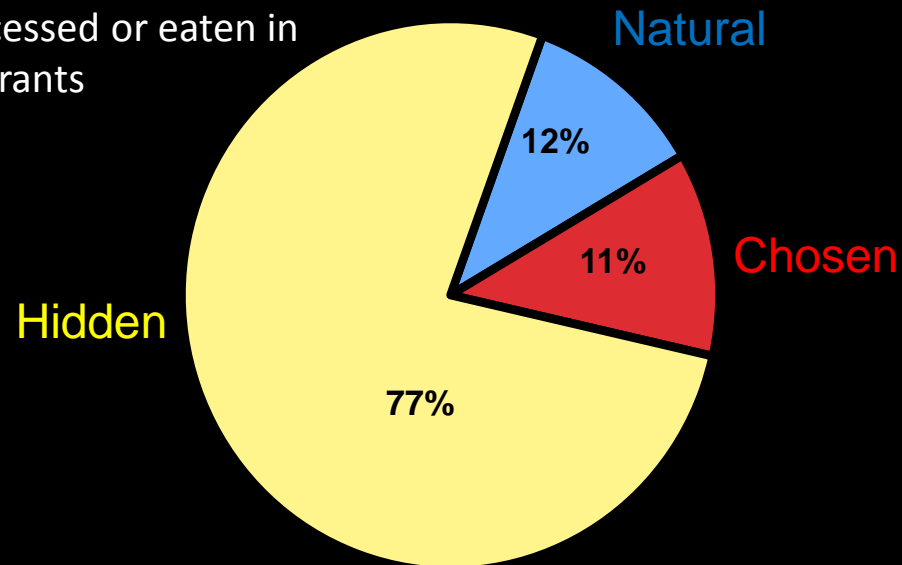
Sea salt



Smoked Sea salt

WHERE IN OUR DIET DOES SALT COME FROM?

In regions where most food is processed or eaten in restaurants



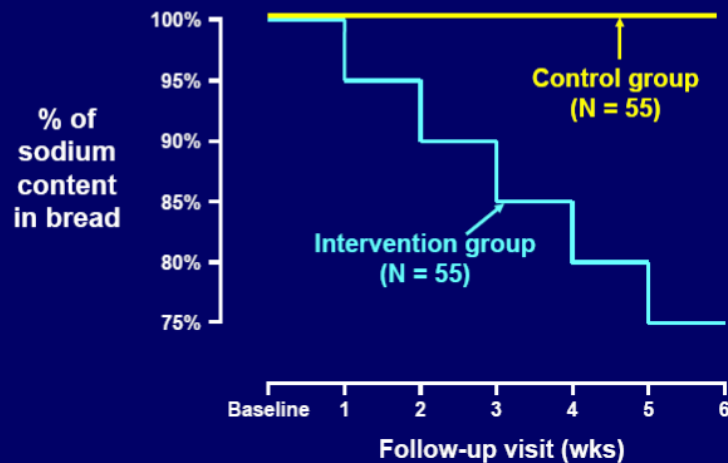
- Occurs Naturally in Foods
- Added at the Table or in Cooking
- Restaurant/Processed Food

J Am College of Nutrition. 1991;10:383-93.

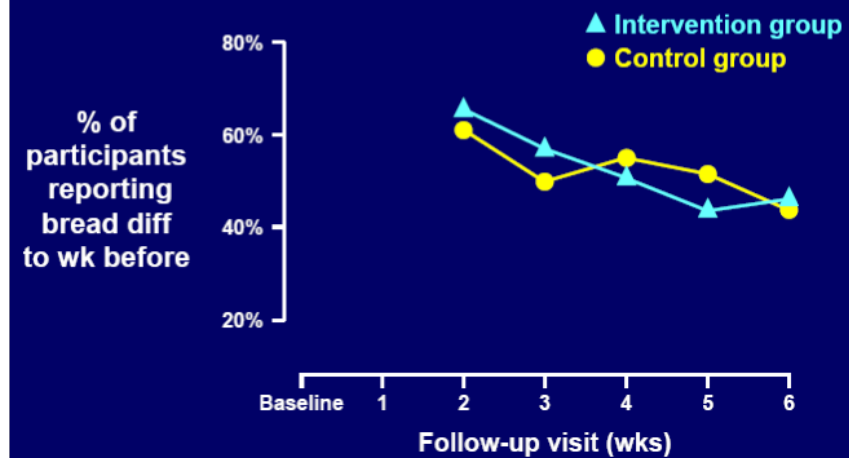


A gradual reduction in the salt content of food is not detected by consumers!

Randomised Controlled Trial



Taste



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?

ADULTS	TARGET	CURRENT CONSUMPTION
All	6 g salt per day or less	8.1 g salt per day
Men	6 g salt per day or less	9.3 g salt per day
Women	6 g salt per day or less	6.8 g salt per day

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

	LOW	MEDIUM	HIGH
SALT	0 – 0.3 g	0.3 – 1.5 g	More than 1.5 g
SODIUM	0 – 0.1 g	0.1 – 0.6 g	More than 0.6 g



17.2
g

8.6
g

2.9
g

5.8
g

1 TBS
6,900 mg

1/2 TBS
3,450 mg

1/2 TSP
1,150 mg

1 TSP
2,300 mg

EFFECTS OF A MODERATE REDUCTION IN SALT INTAKE



REDUCES
High
blood
pressure



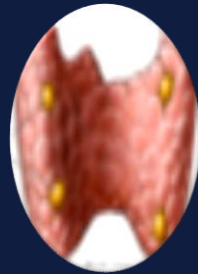
PREVENTS
Stroke



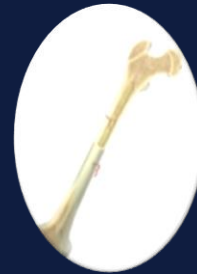
PREVENTS
Heart
disease



REDUCES
Fluid
retention,
albumin and
calcium
excretion



PREVENTS
High
parathyroid
hormone



REDUCES
Bone mineral
loss and
osteoporosis



MAY REDUCE
Stomach cancer



MAY REDUCE
Cataract



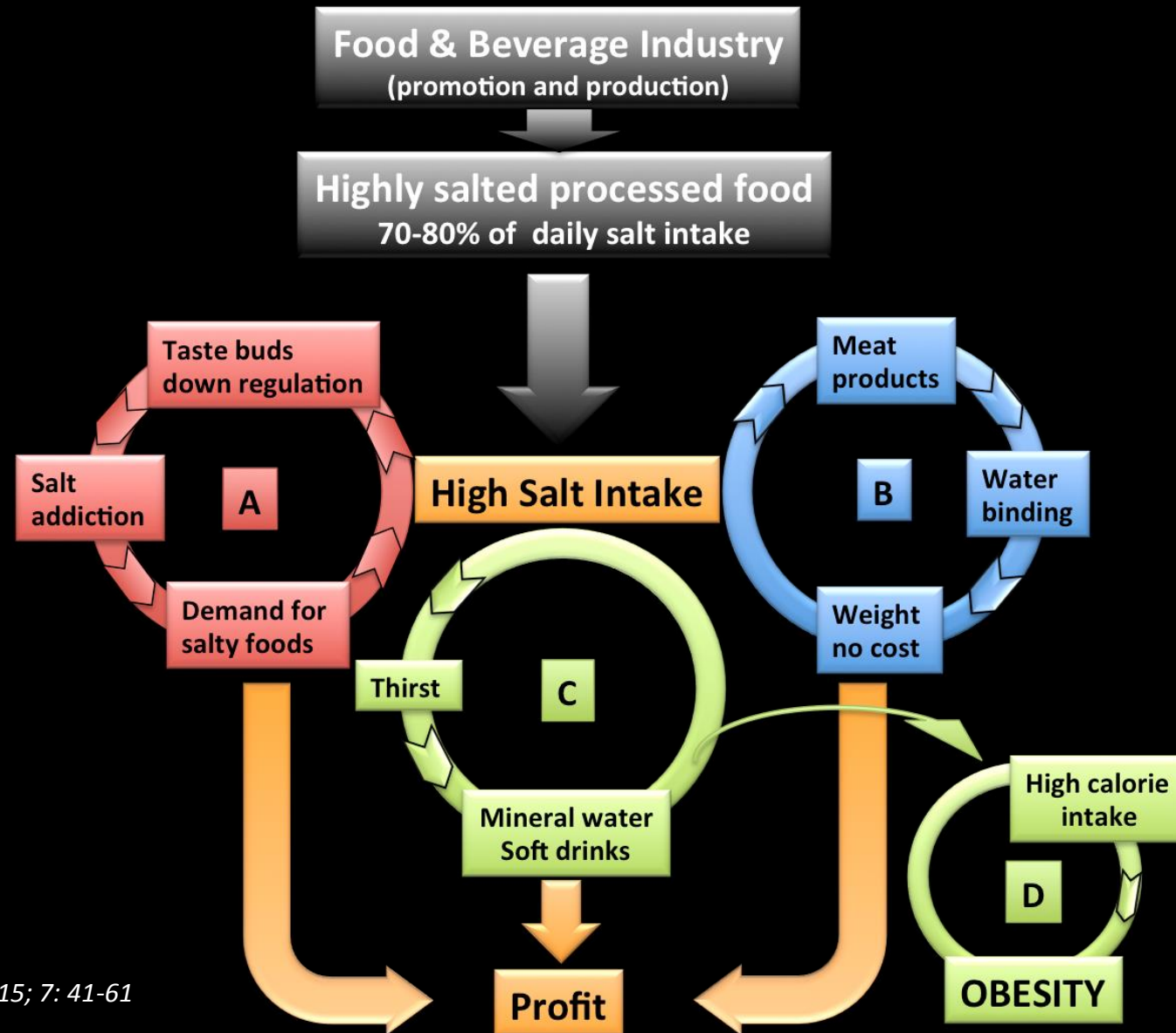
WHO OWNS WHAT IN THE FOOD INDUSTRY?

Source: Fritz Kreiss/Occupy Monsanto



“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'



HAVING FUN!



FINAL SUCCESS!

