

The evaluation of fried potato chips with reduced oil content

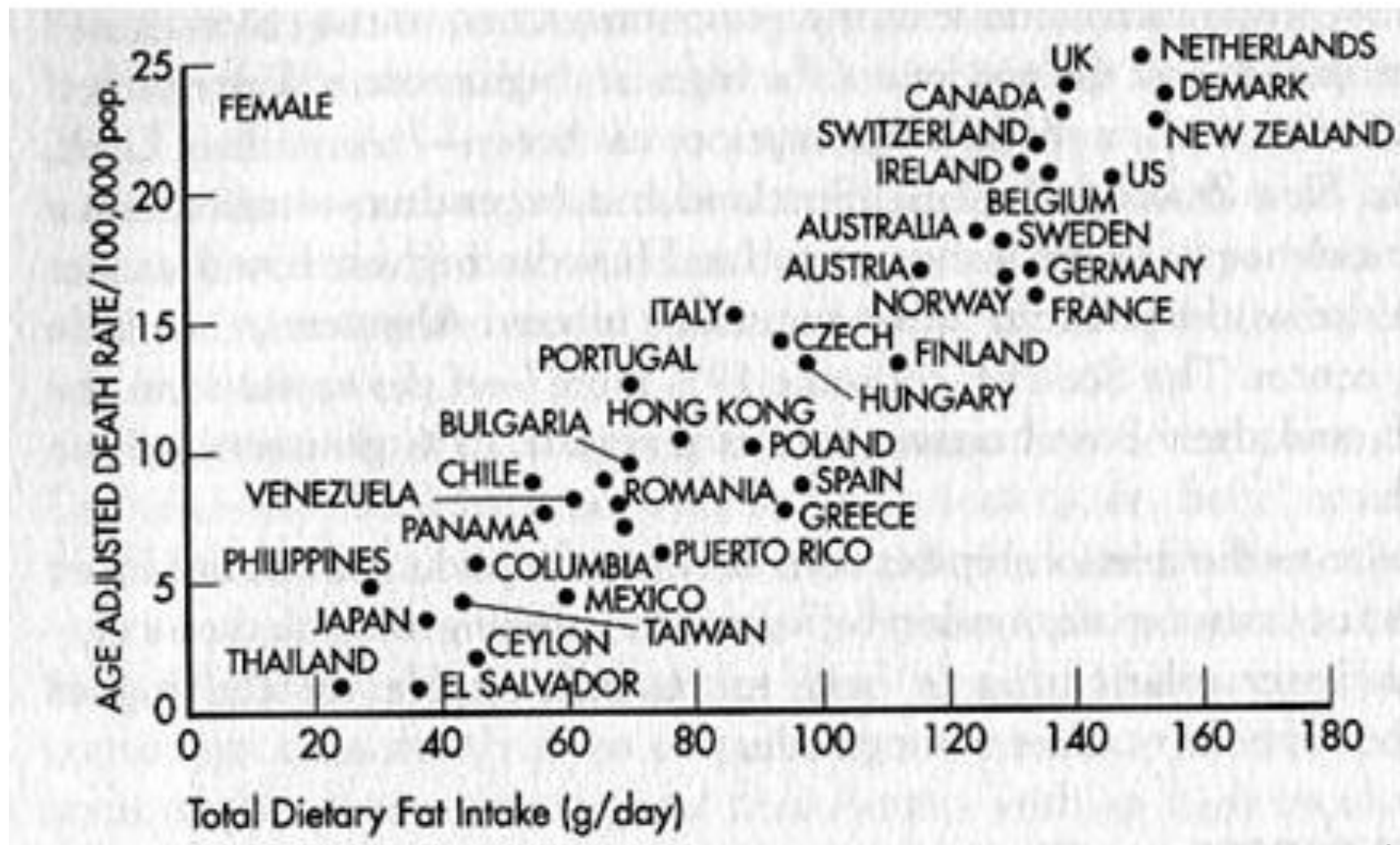
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Reduce Oil Absorption in Fried Foods

Benefits

- High fat diet correlated with mortality
- Increasingly health conscious society
- Reduction in Community Health Spending
- Competitive edge in the corporate world

Fat Intake Correlates with Mortality



Experimental Procedure

- Two chip batches from the same tuber
- TREATED SAMPLE was immersed for 15min in a solution (A) then immersed for 15min in a solution (B)
- The UNTREATED SAMPLE was treated in water *in lieu* of solutions A + B.
- Both batches were then fried simultaneously side by side for 2.45 mins (RR protocol).
- Following this, the samples are weighed and the oil is extracted from the sample.

Comparison of Fat in Treated & Untreated Potato Chips

LAB #	TREATMENT	BATCH	STARTING WEIGHT	FLASK BEGINNING WEIGHT	FLASK END WEIGHT	DIFFERENCE (g)	% FAT
20120808A	Treated	A	5.3925	74.3010	74.8770	0.5760	10.68%
20120808B	Untreated		5.0576	74.6240	75.5140	0.8900	17.60%
20120809A	Treated	B	6.8761	73.8540	74.5570	0.7030	10.22%
20120809B	Untreated		6.2027	71.9750	73.4200	1.4450	23.30%
20120809C	Treated	C	5.6273	74.1100	74.8140	0.7040	12.51%
20120809D	Untreated		5.2296	71.7600	73.3460	1.5860	30.33%
20120828A	Treated	D	4.649	74.6150	74.7700	0.1550	3.33%
20120828B	Untreated		5.3749	72.0660	72.4200	0.3540	6.59%
20120828D	Treated	E	4.4284	74.3970	74.5550	0.1580	3.57%
20120828E	Untreated		5.0932	74.2110	74.4690	0.2580	5.07%
20120829A	Treated	F	5.2323	74.6420	75.0420	0.4000	7.64%
20120829B	Untreated		5.1721	71.9270	72.6210	0.6940	13.42%
20120829D	Treated	G	5.9928	74.3310	74.8430	0.5120	8.54%
20120829E	Untreated		5.0978	74.1190	74.7770	0.6580	12.91%

Interpretation of data

- Without exception, the treated chips had reduced oil when compared with the untreated chips.
- The reduced oil range is between 30% to 59% when using the HCT coating.

BATCHES	PERCENTAGE DIFFERENCE
A	39%
B	56%
C	59%
D	49%
E	30%
F	43%
G	34%

Phases of Project

- The low fat coating of chips (TREATED SAMPLE) produces fried products with less oil than products left UNTREATED sample.
- Phase II – Adaptation to McCain Process.
 - Laboratory trials: reducing the treatment time from 15 mins. for each solution A + B, to 5 mins.
 - Viscosity change: The temperature of the solutions will be increased to 40°C from room temperature concurrently with dipping time adjustment.
- Phase III – Production at McCain UK
- Phase IV – Concept Store Trials.

Reduction of Dipping Time –Preliminary DATA

Raw Data

LAB #	TREATMENT	BATCH	STARTING WEIGHT	FLASK BEGINNING WEIGHT	FLASK END WEIGHT	DIFFERENCE (g)	% FAT
05-Sep-12	Treated 15/15 RT °C	E	5.4565	74.5680	74.9400	0.3720	6.82%
05-Sep-12	Untreated		5.1742	74.0520	74.7490	0.6970	13.47%
05-Sep-12	Modified 5/5 40°C		5.661	71.676	72.1690	0.4930	8.71%
05-Sep-12	Treated 15/15 RT °C	F	5.0114	71.9010	72.3000	0.3990	7.96%
05-Sep-12	Untreated		4.9123	74.2130	74.9960	0.7830	15.94%
05-Sep-12	Modified 5/5 40°C		4.8751	73.8520	74.3060	0.4540	9.31%

Percentage difference between each batch

E	Untreated versus Modified (5@40)	35.35%
	Untreated versus Treated (15@RT)	49.39%
F	Untreated versus Modified	41.58%
	Untreated versus Treated	50.05%

Percentage difference between the average of the different treatments

Untreated versus Modified	38.72%
Untreated versus Treated	49.75%

Conclusion

- Excessive Dietary Fat Intake is undesirable.
- Quick Service industry sell high fat products.
- HCT coating reduces the fat content of a typical potato chip by 30% to 60%.
- Preliminary data from process modification exercise is promising.