



ENVIRONMENTAL LAW FOUNDATION
1736 Franklin Street, 9th Floor, Oakland, California 94612 510 208-4555 fax 510 208-4562

How Potato Chips Stack Up: Levels of Cancer-Causing Acrylamide in Popular Brands of Potato Chips

June 2005

Report by the Environmental Law Foundation

Embargoed until Thursday, June 16 at 10:30am



How Chips Stack Up: Levels of Cancer-Causing Acrylamide in Popular Brands of Potato Chips

According to the United States Environmental Protection Agency acrylamide is a probable human carcinogen. Acrylamide was listed by the Governor of California as a chemical known to cause cancer on January 1, 1990, under the Safe Drinking Water and Toxic Enforcement Act of 1986 (Prop 65).

In 2002, it was reported that acrylamide is formed during high temperature cooking of starchy foods (Biederman et al., 2002a,b). Many plant-based foods that are baked or fried at high temperatures were found to contain acrylamide. Reports of acrylamide in prepared food led to an evaluation of the potential public impacts from the consumption of acrylamide in the average diet (EU, 2003).

Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA) has established a threshold level for when exposure to acrylamide requires a Prop 65 warning at 0.2 micrograms per day (ug/day). All exposures above that level require a "clear and reasonable" warning. A recent evaluation of acrylamide levels in potato chips found that acrylamide levels in major brands exceed this level, some by as much as 910 times.¹

The Environmental Law Foundation, the Law Offices of Rose, Klein, & Marias, LLP, and the Law Office of Gideon Kracov recently evaluated the concentration of acrylamide in different commercially and widely available potato chip brands. Independent consultants conducted the sampling according to a project sampling and analysis plan (SAP) and a quality assurance plan (QAP). Three samples of each potato chip product were delivered to a certified analytical laboratory for analysis using an FDA-approved protocol. Analysis revealed that all samples tested contained acrylamide at levels exceeding the recently revised Proposition 65 warning threshold level (the 0.2 ug/day No Significant Risk Level), even when the manufacturer's 1 oz. serving size was taken into consideration.

¹ OEHHA has a pending proposal to raise the threshold to 1.0 micrograms/day, based on newer animal toxicity data. The new level, if and when it takes effect, does not change the results regarding these potato chip products. All would exceed the new level and therefore require warnings.

Embargoed until Thursday, June 16 at 10:30am

To determine the potential health risks from the consumption of acrylamide in potato chips, a daily dose, in micrograms per day, was calculated from the analytical results. Published studies estimating various daily food consumption rates for potato chips ranged from 4 grams per day (approx. 0.1oz. or 2 chips) to 41 grams per day (approx. 1.5 oz. or 25 chips). The FDA-recommended serving size for potato chips, which is based on daily consumption estimates, is 1 ounce or 28 grams (which, for most manufacturers, is roughly 17 chips)². This consumption rate (28 grams/day) was multiplied by the average acrylamide concentration in each product to calculate the number of micrograms of acrylamide ingested per day.

This analysis found that every potato chip product tested contained between 39 and 910 times more acrylamide than the Prop 65 warning threshold currently allows. According to this analysis, each of the products tested requires a warning about cancer risk from acrylamide.³ See Table 1.

² All potato chips and crisps are manufactured slightly differently. The number of chips per serving is estimated.

³ As noted, the new proposed threshold will not change the legal result: all products tested will require warnings.

Embargoed until Thursday, June 16 at 10:30am

Table 1

Products Tested	Manufacturer	Mean Concentration ppb (ug/kg)	Serving Size 1 ounce = 28 grams	Number of Chips per Serving	Acrylamide Ingestion (ug/day) When Consumption is 1 oz./day	Number of Times Product Exceeds Prop 65 Warning Requirement*	Number of Times Amount in 1 oz. of Product Exceeds Amount Considered Safe by WHO in 8 oz. Glass of Drinking Water**
Cape Cod Robust Russet	CAPE COD Chips, a subsidiary of Lance, Inc.	6503	1 ounce	~ 19 chips	182	910	1517
Kettle Chips Lightly Salted	Kettle Foods, Inc.	3600	1 ounce	~17 chips	101	505	840
Kettle Chips Honey Dijon	Kettle Foods, Inc.	3540	1 ounce	~ 17 chips	99	495	826
Pringles Snack Stacks (Pizzalicious flavor)	Procter & Gamble Co.	1221	1 tub = 23 g	~ 13 crisps	34	170	285
Lay's Baked!	Frito-Lay, Inc., a subsidiary of PepsiCo, Inc.	1071	1 ounce	~ 11 crisps	30	150	250
Lay's Stax BBQ	Frito-Lay, Inc., a subsidiary of PepsiCo, Inc.	949	1 ounce	~ 13 crisps	27	135	221
Pringles Snack Stacks (Original flavor)	Procter & Gamble Co.	794	1 tub = 23 g	~ 13 crisps	22	110	185
Lay's Baked! KC Masterpiece	Frito-Lay, Inc., a subsidiary of PepsiCo, Inc.	684	1 ounce	~ 11 crisps	19	95	160
Pringles Sweet Mesquite BBQ	Procter & Gamble Co.	678	1 ounce	~ 14 crisps	19	95	158
Lay's Natural Country BBQ	Frito-Lay, Inc., a subsidiary of PepsiCo, Inc.	434	1 ounce	~ 14 chips	12	60	101
Cape Cod Classic Chips	CAPE COD Chips, a subsidiary of Lance, Inc.	320	1 ounce	~ 19 chips	9	45	75
Lay's Light KC Masterpiece BBQ	Frito-Lay, Inc., a subsidiary of PepsiCo, Inc.	276	1 ounce	~ 20 chips	7.7	38.5	64

* The current level at which a Proposition 65 warning is required is 0.2 ug/day. There is a pending proposal to change that level to 1.0 ug/day. The current figure is used in this table.

** The World Health Organization (WHO) Guideline for Acrylamide in Drinking Water is 0.5 ug/Liter.
http://www.who.int/foodsafety/publications/chem/acrylamide_faqs/en/index3.html

Embargoed until Thursday, June 16 at 10:30am

High acrylamide levels in potato chips are not inevitable, however. Research has demonstrated that acrylamide levels in potato chips can be reduced by a number of processes including, but not limited to: (1) choosing different varieties of potato; (2) avoiding sugar dips/ coatings in partially cooked products; (3) increasing product moisture; (4) lowering pH; (5) storing products at higher temperatures; (6) changing temperature/cooking regimes; (7) cooking products at lower temperatures; (8) adding asparaginase; (9) replacing ammonium; and, (10) changing cooking oils.

REFERENCES

- Biedermann, M., et al., 2002a. *Experiments on acrylamide formation and possibilities to decrease the potential of acrylamide formation in potatoes*. *Mitteilungen aus Lebensmitteluntersuchung und Hygiene* 93: 668-687.
- European Commission, 2003. Note of the meeting of Experts on Industrial Contaminants in Food: Acrylamide Workshop, 20-21 October 2003: Information on Ways to Lower the Levels of Acrylamide Formed in Food European Commission (EU) Acrylamide Workshop October 20-21, 2003
http://europa.eu.int/comm/food/food/chemicalsafety/contaminants/acryl_guidance.pdf
- Robie E., DiNovi M., 2003. *The Exposure Assessment for Acrylamide*. U.S. Food And Drug Administration, Office of Food Additive Safety presentation to the JIFSAN workshop in Chicago, February 24, 2003.
- Smiciklas-Wright, et al., 2002. *Foods Commonly Eaten in the United States, Quantities Consumed Per Eating Occasion in a Day, 1994-96*, U.S. Department of Agriculture (USDA) NFS Report Number 96-5.

Covance Laboratories, Inc.
 3301 Kinsman Boulevard
 Madison, Wisconsin 53704
 (608) 242-2738

Product	Sample ID Number	Sample Description	Analyses Requested	Special Instructions
Pringles Sweet Mesquite BBQ	1	A-PSM L50181662GO 1.324 4/2006	Acrylamide	Homogenize > 25 g
Pringles Original Snack Stack	2	V-PO L50411662DC 1041 2/2006	Acrylamide	Homogenize > 25 g
Pringles Pizzalicious Snack Stack	3	A-PP	Acrylamide	Homogenize > 25 g
Lay's Baked! Original	4	V-LB 44811119 Jun 28	Acrylamide	Homogenize > 25 g
Lay's Baked! KC Masterpiece BBQ	5	A-LBM 648209210 Jun 14	Acrylamide	Homogenize > 25 g
Lay's Light KC Masterpiece BBQ	6	V-LLKM 374310314 Jun 14 4:55 23	Acrylamide	Homogenize > 25 g
Lay's Stax KC Masterpiece BBQ	7	V-LSBBQ 35941031 8-19:29 18 Apr 06	Acrylamide	Homogenize > 25 g
Lay's Natural Country BBQ	8	A-LNBBQ 2492088 M03 06 2 Aug 05	Acrylamide	Homogenize > 25 g
Kettle Chips Lightly Salted	9	SF-KCLS 2 073 5 14 Sep 05	Acrylamide	Homogenize > 25 g
Kettle Chips Honey Dijon	10	A-KCHD 6 1065 16 Oct 05	Acrylamide	Homogenize > 25 g
Cape Cod Classic	11	A-CCCP	Acrylamide	Homogenize > 25 g
Cape Cod Robust Russet	12	SB-CCR H0104C3 04:02 Apr 19 05	Acrylamide	Homogenize > 25 g
Pringles Sweet Mesquite BBQ	13	R-PSM L5005166200 0340 4/2006	Acrylamide	Homogenize > 25 g
Pringles Original Snack Stack	14	C-PO L50411662DB 2345 2/2006	Acrylamide	Homogenize > 25 g
Pringles Pizzalicious Snack Stack	15	R-PP L43271662DC 0504 11/2005	Acrylamide	Homogenize > 25 g

Lay's Baked! Original	16	SB-LB 548309110 Jun 7	Acrylamide	Homogenize > 25 g
Lay's Baked! KC Masterpiece BBQ	17	V-LBM 34831108 2:15 Jun 28	Acrylamide	Homogenize > 25 g
Lay's Light KC Masterpiece BBQ	18	R-LLKM 174208717 17:55 14 May 31	Acrylamide	Homogenize > 25 g
Lay's Stax KC Masterpiece BBQ	19	R-LSBBQ 15940321 B 5:48 28 Feb 06	Acrylamide	Homogenize > 25 g
Lay's Natural Country BBQ	20	A-LNBBQ 2492074 M0663 19 Jul 05	Acrylamide	Homogenize > 25 g
Kettle Chips Lightly Salted	21	P-KCLS 4 105 3 15 Oct 05	Acrylamide	Homogenize > 25 g
Kettle Chips Honey Dijon	22	V-KCHD 5 106 5 16 Oct 05	Acrylamide	Homogenize > 25 g
Cape Cod Classic	23	R-CCCP	Acrylamide	Homogenize > 25 g
Cape Cod Robust Russet	24	SB-CCR H01 25F1 9:22 May 1 2005	Acrylamide	Homogenize > 25 g
Pringles Sweet Mesquite BBQ	25	SBM-PSM L5002166200 1956 4/2006	Acrylamide	Homogenize > 25 g
Pringles Original Snack Stack	26	SF-PO L50431662JO 0708 5/2006	Acrylamide	Homogenize > 25 g
Pringles Pizzalicious Snack Stack	27	SB-PP L43051662G0 1145 1/2006	Acrylamide	Homogenize > 25 g
Lay's Baked! Original	28	P-LB 44811049 Jun 21	Acrylamide	Homogenize > 25 g
Lay's Baked! KC Masterpiece BBQ	29	P-LBM 648209910 Jun 21	Acrylamide	Homogenize > 25 g
Lay's Light KC Masterpiece BBQ	30	P-LLKM 174108717 11:00 25 May 31	Acrylamide	Homogenize > 25 g
Lay's Stax KC Masterpiece BBQ	31	SB-LSBBQ 65910921 B 08:55 11 Apr 06	Acrylamide	Homogenize > 25 g
Lay's Natural Country BBQ	32	A-LNBBQ 2491088 M06 05 2 Aug 05	Acrylamide	Homogenize > 25 g
Kettle Chips Lightly Salted	33	WF-KCLS 40736 14 Jul 05	Acrylamide	Homogenize > 25 g

Kettle Chips Honey Dijon	34	WF-KCHD 6 0893 30 Sep 05	Acrylamide	Homogenize > 25 g
Cape Cod Classic	35	P-CCCP 0033051 Jul 12 05	Acrylamide	Homogenize > 25 g
Cape Cod Robust Russet	36	SB-CCR H0104C3 04:02 Apr 19 05	Acrylamide	Homogenize > 25 g

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

SAMPLE NUMBER: 50500302
BATCH NUMBER: 50500302
DATE ENTERED: 05/03/05
REPORT PRINTED: 05/10/05

SAMPLE: 1, A-PSM, L50181662G0, 1324, 4/2006

PURCHASE ORDER NUMBER: CHARGE - VISA

<u>ASSAY</u>	<u>ANALYSIS</u>	<u>UNITS</u>
ACRYLAMIDES BY LCMS	790.	PFB

METHOD REFERENCES

ACRYLAMIDES BY LCMS
United States Food and Drug Administration, Center for Food Safety and Applied
Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and
Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

SAMPLE NUMBER: 50500303
BATCH NUMBER: 50500302
DATE ENTERED: 05/03/05
REPORT PRINTED: 05/10/05

SAMPLE: 2, V-PO, L50411662DC, 1041, 2/2006
(COMPOSITE OF 8)

PURCHASE ORDER NUMBER: CHARGE - VISA

ASSAY
ACRYLAMIDES BY LCMS

<u>ANALYSIS</u>	<u>UNITS</u>
884.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied
Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and
Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

SAMPLE NUMBER: 50500304
BATCH NUMBER: 50500302
DATE ENTERED: 05/03/05
REPORT PRINTED: 05/10/05

SAMPLE: 3, A-PP
(COMPOSITE OF 8)

PURCHASE ORDER NUMBER: CHARGE - VISA

ASSAY
ACRYLAMIDES BY LCMS

<u>ANALYSIS</u>	<u>UNITS</u>
1800.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 808/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

SAMPLE NUMBER: 50500305
BATCH NUMBER: 50500302
DATE ENTERED: 05/03/05
REPORT PRINTED: 05/10/05

SAMPLE: 4, V-LB, 44811119, JUN 28

PURCHASE ORDER NUMBER: CHARGE - VISA

ASSAY
ACRYLAMIDES BY LCMS

<u>ANALYSIS</u>	<u>UNITS</u>
1320.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS

COVANCE.
THE DEVELOPMENT SERVICES COMPANY

DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

SAMPLE NUMBER: 50500306

BATCH NUMBER: 50500302

DATE ENTERED: 05/03/05

REPORT PRINTED: 05/10/05

SAMPLE: 5, A-LBM, 648209210, JUN 14

PURCHASE ORDER NUMBER: CHARGE - VISA

ASSAY
ACRYLAMIDES BY LCMS

<u>ANALYSIS</u>	<u>UNITS</u>
598.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied
Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and
Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



SAMPLE NUMBER: 50500307

DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

BATCH NUMBER: 50500302

DATE ENTERED: 05/03/05

REPORT PRINTED: 05/10/05

SAMPLE: 6, V-LLKM, 374310314, JUN 14, 4:55, 23

PURCHASE ORDER NUMBER: CHARGE - VISA

ASSAY
ACRYLAMIDES BY LCMS

<u>ANALYSIS</u>	<u>UNITS</u>
203.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied
Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and
Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



SAMPLE NUMBER: 50500308

DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

BATCH NUMBER: 50500302

DATE ENTERED: 05/03/05

REPORT PRINTED: 05/10/05

SAMPLE: 7, V-LSBBQ, 35941031, 8-19:29, 18 APR 06

PURCHASE ORDER NUMBER: CHARGE - VISA

ASSAY
ACRYLAMIDES BY LCMS

<u>ANALYSIS</u>	<u>UNITS</u>
748.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied
Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and
Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



SAMPLE NUMBER: 50500309

DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

BATCH NUMBER: 50500302

DATE ENTERED: 05/03/05

REPORT PRINTED: 05/10/05

SAMPLE: 8, A-LNBBQ, 2492088, MO3 06, 2 AUG 05

PURCHASE ORDER NUMBER: CHARGE - VISA

<u>ASSAY</u>	<u>ANALYSIS</u>	<u>UNITS</u>
ACRYLAMIDES BY LCMS	460.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

SAMPLE NUMBER: 50500310
BATCH NUMBER: 50500302
DATE ENTERED: 05/03/05
REPORT PRINTED: 05/10/05

SAMPLE: 9, SF-KCLS, 2 0735, 14 SEP 05

PURCHASE ORDER NUMBER: CHARGE - VISA

ASSAY
ACRYLAMIDES BY LCMS

<u>ANALYSIS</u>	<u>UNITS</u>
3430.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



SAMPLE NUMBER: 50500311

DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

BATCH NUMBER: 50500302

DATE ENTERED: 05/03/05

REPORT PRINTED: 05/10/05

SAMPLE: 10, A-KCHD, 6 1065, 16 OCT 05

PURCHASE ORDER NUMBER: CHARGE - VISA

ASSAY
ACRYLAMIDES BY LCMS

<u>ANALYSIS</u>	<u>UNITS</u>
3160.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied
Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and
Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



SAMPLE NUMBER: 50500312

DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

BATCH NUMBER: 50500302

DATE ENTERED: 05/03/05

REPORT PRINTED: 05/10/05

SAMPLE: 11, A-CCCP

PURCHASE ORDER NUMBER: CHARGE - VISA

ASSAY
ACRYLAMIDES BY LCMS

<u>ANALYSIS</u>	<u>UNITS</u>
163.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

SAMPLE NUMBER: 50500313
BATCH NUMBER: 50500302
DATE ENTERED: 05/03/05
REPORT PRINTED: 05/11/05

SAMPLE: 12, SB-CCR, H0104C3, 04:02, APR 19 05

PURCHASE ORDER NUMBER: CHARGE - VISA

ASSAY
ACRYLAMIDES BY LCMS

<u>ANALYSIS</u>	<u>UNITS</u>
6320.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied
Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and
Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

SAMPLE NUMBER: 50502907

BATCH NUMBER: 50502907

DATE ENTERED: 05/12/05

REPORT PRINTED: 05/17/05

SAMPLE: 13, R-PSM, L5005166200, 0340, 4/2006

PURCHASE ORDER NUMBER: CHARGE - VISA

ASSAY
ACRYLAMIDES BY LCMS

<u>ANALYSIS</u>	<u>UNITS</u>
838.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

SAMPLE NUMBER: 50502908

BATCH NUMBER: 50502907

DATE ENTERED: 05/12/05

REPORT PRINTED: 05/17/05

SAMPLE: 14, C-PO, L50411662DB, 2345, 2/2006
(COMPOSITE OF 3)

PURCHASE ORDER NUMBER: CHARGE - VISA

ASSAY
ACRYLAMIDES BY LCMS

<u>ANALYSIS</u>	<u>UNITS</u>
945.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied
Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and
Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

SAMPLE NUMBER: 50502909
BATCH NUMBER: 50502907
DATE ENTERED: 05/12/05
REPORT PRINTED: 05/17/05

SAMPLE: 15, R-PP, L43271662DC, 0504, 11/2005
(COMPOSITE OF 8)

PURCHASE ORDER NUMBER: CHARGE - VISA

ASSAY
ACRYLAMIDES BY LCMS

<u>ANALYSIS</u>	<u>UNITS</u>
1240.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied
Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and
Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

SAMPLE NUMBER: 50502910

BATCH NUMBER: 50502907

DATE ENTERED: 05/12/05

REPORT PRINTED: 05/17/05

SAMPLE: 16, SB-LB, 548309110, JUN 7

PURCHASE ORDER NUMBER: CHARGE - VISA

<u>ASSAY</u>	<u>ANALYSIS</u>	<u>UNITS</u>
ACRYLAMIDES BY LCMS	1040.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS
United States Food and Drug Administration, Center for Food Safety and Applied
Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and
Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

SAMPLE NUMBER: 50502911
BATCH NUMBER: 50502907
DATE ENTERED: 05/12/05
REPORT PRINTED: 05/17/05

SAMPLE: 17, V-LBM, 34831108, 2:15, JUN 28

PURCHASE ORDER NUMBER: CHARGE - VISA

<u>ASSAY</u>	<u>ANALYSIS</u>	<u>UNITS</u>
ACRYLAMIDES BY LCMS	738.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS
United States Food and Drug Administration, Center for Food Safety and Applied
Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and
Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



SAMPLE NUMBER: 50502912

DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

BATCH NUMBER: 50502907

DATE ENTERED: 05/12/05

REPORT PRINTED: 05/17/05

SAMPLE: 18, R-LLKM, 174208717, 17:55, 14, MAY 31

PURCHASE ORDER NUMBER: CHARGE - VISA

<u>ASSAY</u>	<u>ANALYSIS</u>	<u>UNITS</u>
ACRYLAMIDES BY LCMS	338.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS
United States Food and Drug Administration, Center for Food Safety and Applied
Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and
Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

SAMPLE NUMBER: 50502913

BATCH NUMBER: 50502907

DATE ENTERED: 05/12/05

REPORT PRINTED: 05/17/05

SAMPLE: 19, R-LSBBQ, 15940321 B, 6:48, 28 FEB 06

PURCHASE ORDER NUMBER: CHARGE - VISA

ASSAY
ACRYLAMIDES BY LCMS

<u>ANALYSIS</u>	<u>UNITS</u>
468.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS
United States Food and Drug Administration, Center for Food Safety and Applied
Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and
Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

SAMPLE NUMBER: 50502914
BATCH NUMBER: 50502907
DATE ENTERED: 05/12/05
REPORT PRINTED: 05/17/05

SAMPLE: 20, A-LNBBQ, 2492074, MO6 63, 19 JUL 05

PURCHASE ORDER NUMBER: CHARGE - VISA

<u>ASSAY</u>	<u>ANALYSIS</u>	<u>UNITS</u>
ACRYLAMIDES BY LCMS	401.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

SAMPLE NUMBER: 50502915
BATCH NUMBER: 50502907
DATE ENTERED: 05/12/05
REPORT PRINTED: 05/17/05

SAMPLE: 21, P-KCLS, 4 105 3, 15 OCT 05

PURCHASE ORDER NUMBER: CHARGE - VISA

<u>ASSAY</u>	<u>ANALYSIS</u>	<u>UNITS</u>
ACRYLAMIDES BY LCMS	3750.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

SAMPLE NUMBER: 50502916
BATCH NUMBER: 50502907
DATE ENTERED: 05/12/05
REPORT PRINTED: 05/17/05

SAMPLE: 22, V-KCHD, 5 106 5, 16 OCT 05

PURCHASE ORDER NUMBER: CHARGE - VISA

ASSAY
ACRYLAMIDES BY LCMS

<u>ANALYSIS</u>	<u>UNITS</u>
3860.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied Nutrition
Office of Plant & Dairy Foods and Beverages, "Detection and Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

SAMPLE NUMBER: 50502917
BATCH NUMBER: 50502907
DATE ENTERED: 05/12/05
REPORT PRINTED: 05/17/05

SAMPLE: 23, R-CCCP

PURCHASE ORDER NUMBER: CHARGE - VISA

ASSAY
ACRYLAMIDES BY LCMS

<u>ANALYSIS</u>	<u>UNITS</u>
292.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied
Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and
Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



SAMPLE NUMBER: 50502918

DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

BATCH NUMBER: 50502907

DATE ENTERED: 05/12/05

REPORT PRINTED: 05/18/05

SAMPLE: 24, SB-CCR, HOL 25F1, 9:22, MAY 10 05

PURCHASE ORDER NUMBER: CHARGE - VISA

ASSAY
ACRYLAMIDES BY LCMS

<u>ANALYSIS</u>	<u>UNITS</u>
7080.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

SAMPLE NUMBER: 50502919
BATCH NUMBER: 50502907
DATE ENTERED: 05/12/05
REPORT PRINTED: 05/17/05

SAMPLE: 25, SBM-PSM, L5002166200, 1956, 412006

PURCHASE ORDER NUMBER: CHARGE - VISA

<u>ASSAY</u>	<u>ANALYSIS</u>	<u>UNITS</u>
ACRYLAMIDES BY LCMS	407.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

SAMPLE NUMBER: 50502920

BATCH NUMBER: 50502907

DATE ENTERED: 05/12/05

REPORT PRINTED: 05/17/05

SAMPLE: 26, SF PO, L50431662JO, 0708, 5/2006

PURCHASE ORDER NUMBER: CHARGE - VISA

<u>ASSAY</u>	<u>ANALYSIS</u>	<u>UNITS</u>
ACRYLAMIDES BY LCMS	554.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS
United States Food and Drug Administration, Center for Food Safety and Applied
Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and
Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

SAMPLE NUMBER: 50502921
BATCH NUMBER: 50502907
DATE ENTERED: 05/12/05
REPORT PRINTED: 05/17/05

SAMPLE: 27, SB-PP, L43051662GO, 1145, 1/2006

PURCHASE ORDER NUMBER: CHARGE - VISA

ASSAY
ACRYLAMIDES BY LCMS

<u>ANALYSIS</u>	<u>UNITS</u>
623.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

SAMPLE NUMBER: 50502922
BATCH NUMBER: 50502907
DATE ENTERED: 05/12/05
REPORT PRINTED: 05/17/05

SAMPLE: 28, P-LB, 44811049, JUN 21

PURCHASE ORDER NUMBER: CHARGE - VISA

ASSAY
ACRYLAMIDES BY LCMS

<u>ANALYSIS</u>	<u>UNITS</u>
852.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied
Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and
Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

SAMPLE NUMBER: 50502923
BATCH NUMBER: 50502907
DATE ENTERED: 05/12/05
REPORT PRINTED: 05/17/05

SAMPLE: 29, P-LBM, 648209910, JUN 21

PURCHASE ORDER NUMBER: CHARGE - VISA

ASSAY
ACRYLAMIDES BY LCMS

<u>ANALYSIS</u>	<u>UNITS</u>
716.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

SAMPLE NUMBER: 50502924
BATCH NUMBER: 50502907
DATE ENTERED: 05/12/05
REPORT PRINTED: 05/17/05

SAMPLE: 30, P-LLKM, 174108717, 11:00, 25, MAY 31

PURCHASE ORDER NUMBER: CHARGE - VISA

<u>ASSAY</u>	<u>ANALYSIS</u>	<u>UNITS</u>
ACRYLAMIDES BY LCMS	286.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS

COVANCE.
THE DEVELOPMENT SERVICES COMPANY

DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

SAMPLE NUMBER: 50502925

BATCH NUMBER: 50502907

DATE ENTERED: 05/12/05

REPORT PRINTED: 05/17/05

SAMPLE: 31, SB-LSBQ, 65910921 B, 08:55, 11 APR 06

PURCHASE ORDER NUMBER: CHARGE - VISA

ASSAY

ACRYLAMIDES BY LCMS

ANALYSIS

1630.

UNITS

PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied
Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and
Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 808/241-4471 Fax: 808/241-7227

REPORT OF ANALYSIS



SAMPLE NUMBER: 50502926

DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

BATCH NUMBER: 50502907

DATE ENTERED: 05/12/05

REPORT PRINTED: 05/17/05

SAMPLE: 32, A-LNBBQ, 2491088, MQ6 06, 2 AUG 05

PURCHASE ORDER NUMBER: CHARGE - VISA

<u>ASSAY</u>	<u>ANALYSIS</u>	<u>UNITS</u>
ACRYLAMIDES BY LCMS	440.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

SAMPLE NUMBER: 50502927

BATCH NUMBER: 50502907

DATE ENTERED: 05/12/05

REPORT PRINTED: 05/17/05

SAMPLE: 33, WF-KCLS, 4 0736, 14 JUL 05

PURCHASE ORDER NUMBER: CHARGE - VISA

ASSAY
ACRYLAMIDES BY LCMS

<u>ANALYSIS</u>	<u>UNITS</u>
3620.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied
Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and
Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

SAMPLE NUMBER: 50502928
BATCH NUMBER: 50502907
DATE ENTERED: 05/12/05
REPORT PRINTED: 05/18/05

SAMPLE: 34, WF-KCHD, 60893, 30 SEP 05

PURCHASE ORDER NUMBER: CHARGE - VISA

ASSAY
ACRYLAMIDES BY LCMS

<u>ANALYSIS</u>	<u>UNITS</u>
3600.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



SAMPLE NUMBER: 50502929

DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

BATCH NUMBER: 50502907

DATE ENTERED: 05/12/05

REPORT PRINTED: 05/17/05

SAMPLE: 35, P-CCCP, 0033051, JUL 12 05

PURCHASE ORDER NUMBER: CHARGE - VISA

ASSAY
ACRYLAMIDES BY LCMS

<u>ANALYSIS</u>	<u>UNITS</u>
504.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and Quantitation of Acrylamide in Foods". (2002)

Covance Laboratories Inc.
3301 Kinsman Blvd.
Madison, WI 53704
Tel: 608/241-4471 Fax: 608/241-7227

REPORT OF ANALYSIS



SAMPLE NUMBER: 50502930

DR. PAUL ROSENFELD
SWAPE
201 WILSHIRE BLVD.
2ND FLOOR
SANTA MONICA, CA. 90401

BATCH NUMBER: 50502907

DATE ENTERED: 05/12/05

REPORT PRINTED: 05/18/05

SAMPLE: 36, SB-CCR, HO104C3, 04:02, APR 19 05

PURCHASE ORDER NUMBER: CHARGE - VISA

<u>ASSAY</u>	<u>ANALYSIS</u>	<u>UNITS</u>
ACRYLAMIDES BY LCMS	6110.	PPB

METHOD REFERENCES

ACRYLAMIDES BY LCMS

United States Food and Drug Administration, Center for Food Safety and Applied Nutrition Office of Plant & Dairy Foods and Beverages, "Detection and Quantitation of Acrylamide in Foods". (2002)