

# BIOlogical Research

P.O.Box 1136  
Klamath Falls, OR 97601  
541-885-8804

July 1, 1996

This brief review of the 72 Hour Fresh Juice Stability Study encompasses:

- A. Three of the five juicers used in the study
- B. The time period of just post-juicing through the end of the second hour with data collected at the end of each 15 minute period
- C. Apples and carrots juiced through each of the three reviewed juicers
- D. The parameters - 1. Temperature; 2.pH; and, 3. Carbohydrate index

JUICER SELECTION: The representative juicer types selected for this review include :

- A. GP-E1503 "Green Star Gold" - a one-step, twin-gear triturating type juicer with magnetic and Far infrared technologies
- B. 2-Step Process Juicer - step one is grinding of the produce, and step two includes pressing the juice from the pulp with an hydraulic press
- C. Masticating - a one-step, high-speed, auger-feed type juicer

TIME PERIOD: Most juicer advertisements encourage consumption of fresh squeezed juices just after juicing. It is commonly recognized that many consumers desire to consume their juice leisurely, perhaps taking over an hour. Based upon both manufacturer recommendation and consumer use, this review covers the period of time most generally accepted as common for consumption of fresh squeezed juice. Fifteen minute test periods were established based upon observation of fifty different individuals and their consumption pattern.

PRODUCE SELECTION: Apples and carrots were the produce of choice for this study. Each represents an opposite end of the produce spectrum.

- Apples - a soft, pulpy fruit which is difficult to obtain a pulp-free juice from
- Carrots -a fibrous vegetable that can be difficult to grind without building up heat in the juicer and juice

Both are recognized as the most often juiced members of the produce family.

Commercial grades of apples and carrots were selected from a grocery-chain store. It was determined that more people would choose a commercial grade of produce to juice due to:

- A. Cost
- B. Availability
- C. Organic status determines no pesticide or herbicidal residues; however, the nutritional profile may or may not be superior to commercial grade

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## PARAMETERS:

### Temperature

Juices are heated by the heat build-up created by the speed of the grinding / cutting / masticating mechanism of the juicer. Heat accumulation in the juice exacerbates:

- A. DNA, enzymatic and mineral degeneration
- B. Bacteria proliferation
- C. Fermentation process
- D. More acidic pH

### pH

A higher pH in juice indicates a greater concentration of oxygen present. Minerals such as calcium are more readily absorbed and utilized by the body if they are bound to oxygen. Bio-available minerals are a great part of the reason for consuming fresh squeezed juice. Therefore, fresh squeezed juices need to be as alkaline as possible, and remain that way as long as possible.

### Carbohydrate index

Measures both sugar level and mineral solids. The higher the carbohydrate index:

- A. The greater concentration of minerals present
- B. More complex sugars are present to be used by the body
- C. Sweet taste of the juice increases
- D. Overall stability of the juice increases

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## Apple

- Juiced through 3 different juicers
- Initial temperature of fruit prior to juicing - 15.75 °C

### Temperature of juice

	just after juicing:			at end of two hours:
GP-E1503 "Gold":	...	15.8 °C	...	16.1 °C
2-step:	...	22.9 °C	...	20.2 °C
Mastication:	...	17.4 °C	...	18.0 °C

### pH of juice

	just after juicing			at end of two hours:
GP-E1503 "Gold":	...	4.59	...	4.25
2-step :	...	4.10	...	3.89
Mastication:	...	4.28	...	4.20

### Carbohydrate index of juice :

	just after juicing:			at end of two hours:
GP-E1503 "Gold":	...	13.6	...	13.3
2-step:	...	13.4	...	12.6
Mastication:	...	13.6	...	13.0

## Carrot

- Juiced through 3 different juicers
- Initial temperature of vegetable prior to juicing - 18.7 °C

### Temperature of juice

	just after juicing:			at end of two hours:
GP-E1503 "Gold":	...	19.5 °C	...	20.8 °C
2-Step :	...	23.8 °C	...	22.0 °C
Mastication:	...	21.4 °C	...	21.2 °C

### pH of juice

	just after juicing:			at end of two hours:
GP-E1503 "Gold":	...	6.14	...	6.15
2-step:	...	5.82	...	5.99
Masticating:	...	5.90	...	6.17

### Carbohydrate index of juice:

	just after juicing:			at end of two hours:
GP-E1503 "Gold":	...	9.0	...	8.7
2-step:	...	8.6	...	7.8
Masticating:	...	9.1	...	8.4

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Phone : 541-885-8804

STUDY DATA : FRESH JUICE STABILITY STUDY

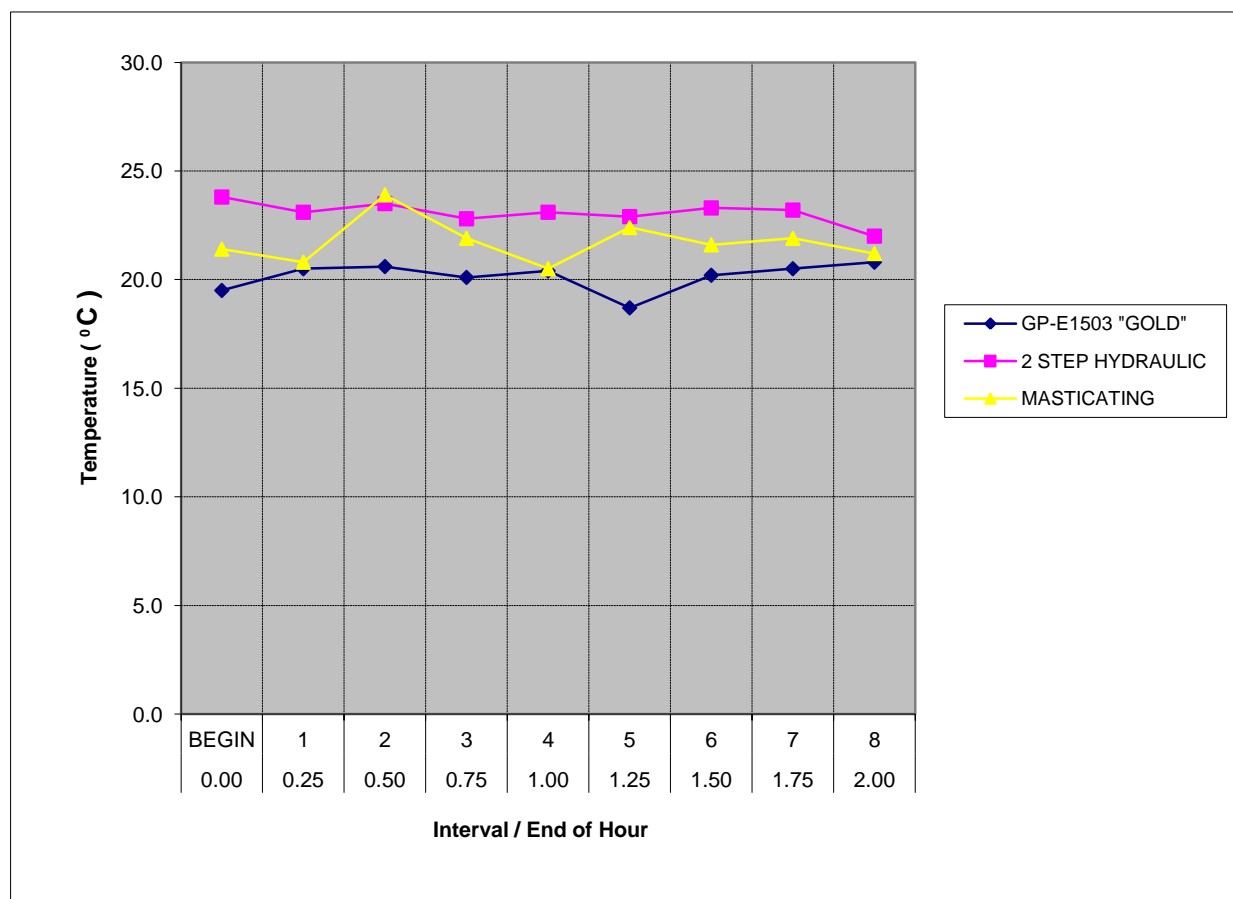
CYCLE : A

ITEM : **CARROT JUICE**

PARAMETERS : 3 JUICERS: GP-E1503 "GOLD", 2-STEP HYDRAULIC, MASTICATING

## TEMPERATURE ( ° C )

END OF HOUR	0.00	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00
INTERVAL	BEGIN	1	2	3	4	5	6	7	8
GP-E1503 "GOLD"	19.5	20.5	20.6	20.1	20.4	18.7	20.2	20.5	20.8
2 STEP HYDRAULIC	23.8	23.1	23.5	22.8	23.1	22.9	23.3	23.2	22.0
MASTICATING	21.4	20.8	23.9	21.9	20.5	22.4	21.6	21.9	21.2



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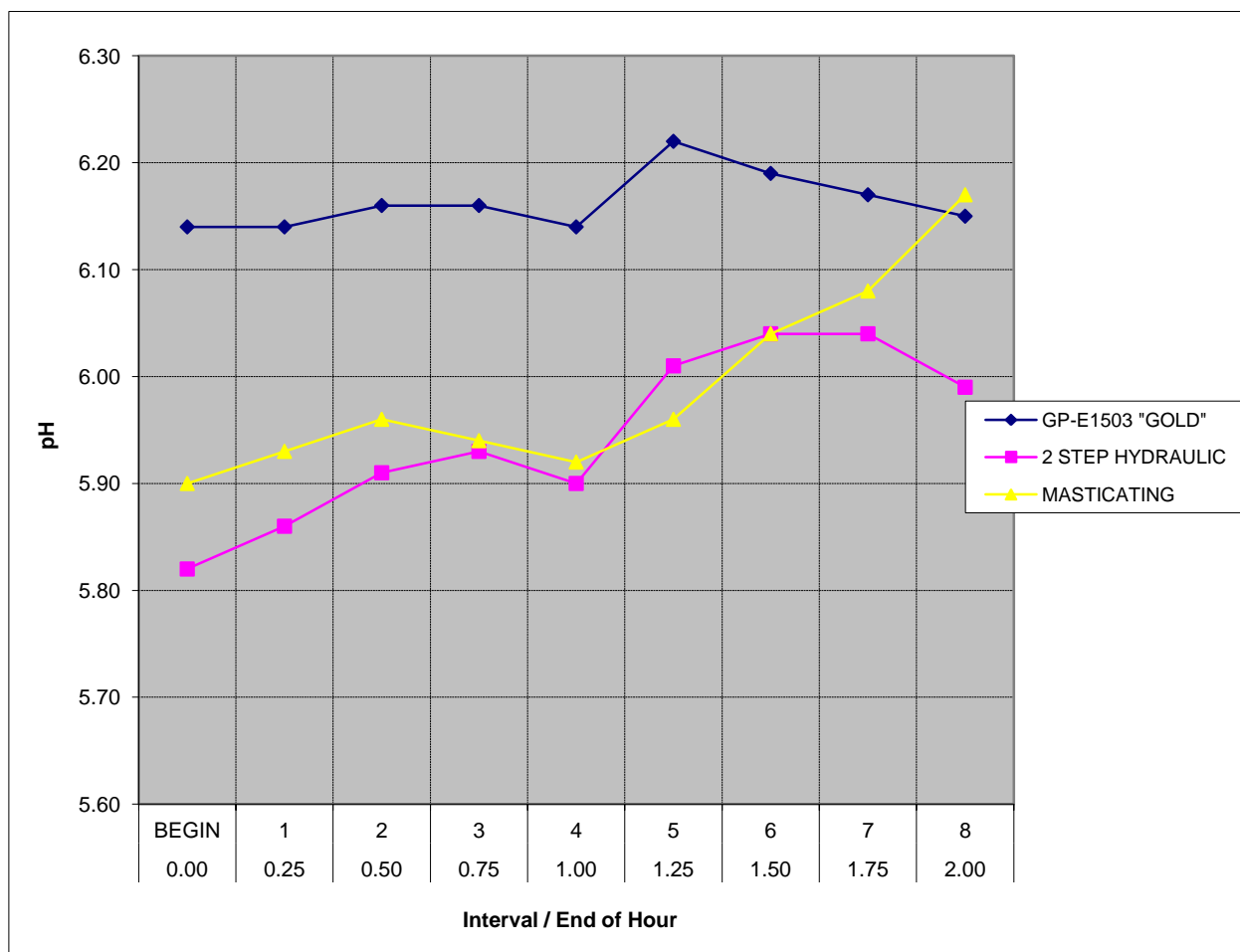
CYCLE : A

ITEM : **CARROT JUICE**

PARAMETERS : 3 JUICERS: GP-E1503 "GOLD", 2-STEP HYDRAULIC, MASTICATING

## pH

END OF HOUR INTERVAL	0.00 BEGIN	0.25 1	0.50 2	0.75 3	1.00 4	1.25 5	1.50 6	1.75 7	2.00 8
GP-E1503 "GOLD"	6.14	6.14	6.16	6.16	6.14	6.22	6.19	6.17	6.15
2 STEP HYDRAULIC	5.82	5.86	5.91	5.93	5.90	6.01	6.04	6.04	5.99
MASTICATING	5.90	5.93	5.96	5.94	5.92	5.96	6.04	6.08	6.17



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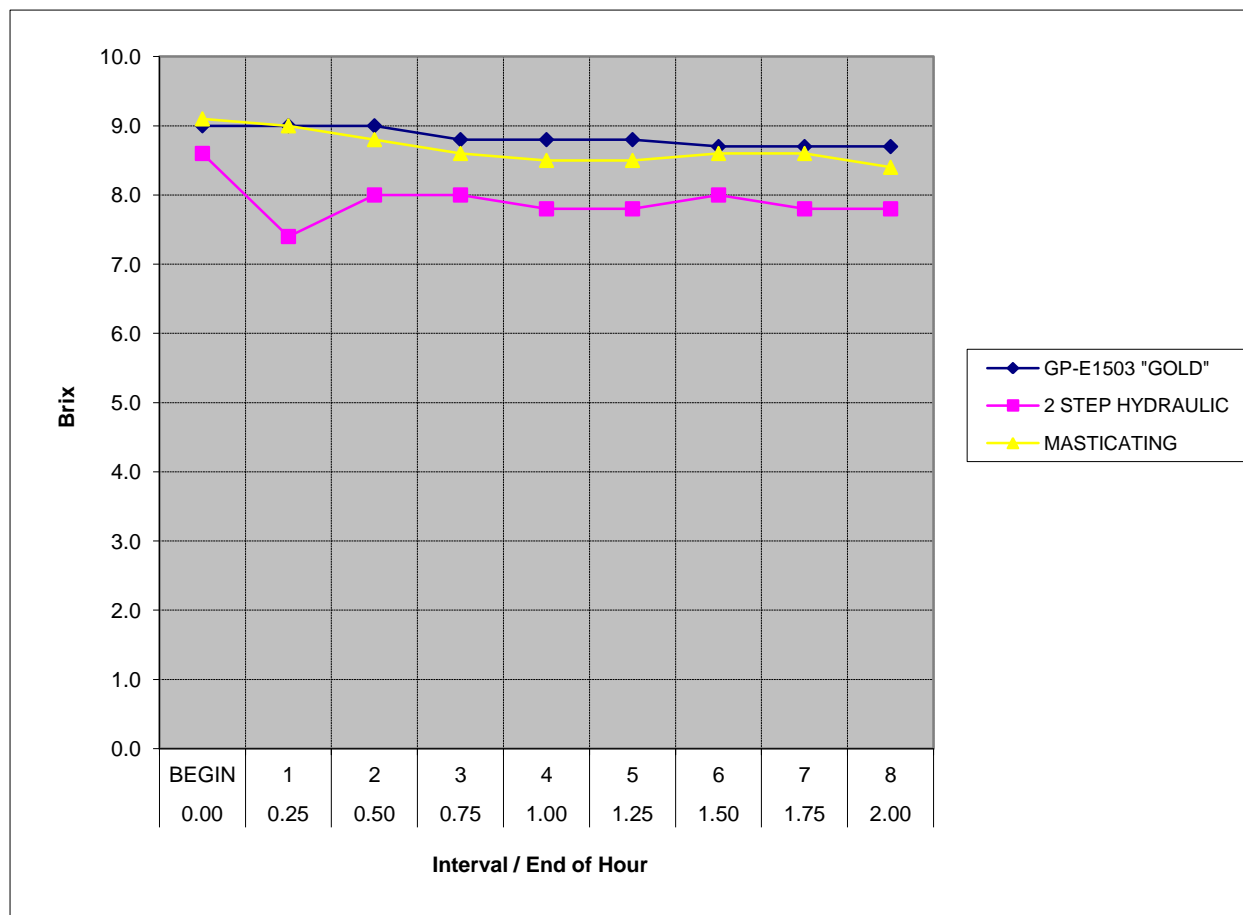
CYCLE : A

ITEM : **CARROT JUICE**

PARAMETERS : 3 JUICERS: GP-E1503 "GOLD", 2-STEP HYDRAULIC, MASTICATING

## CARBOHYDRATE INDEX

END OF HOUR INTERVAL	0.00 BEGIN	0.25 1	0.50 2	0.75 3	1.00 4	1.25 5	1.50 6	1.75 7	2.00 8
GP-E1503 "GOLD"	9.0	9.0	9.0	8.8	8.8	8.8	8.7	8.7	8.7
2 STEP HYDRAULIC	8.6	7.4	8.0	8.0	7.8	7.8	8.0	7.8	7.8
MASTICATING	9.1	9.0	8.8	8.6	8.5	8.5	8.6	8.6	8.4



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STUDY DATA : FRESH JUICE STABILITY STUDY

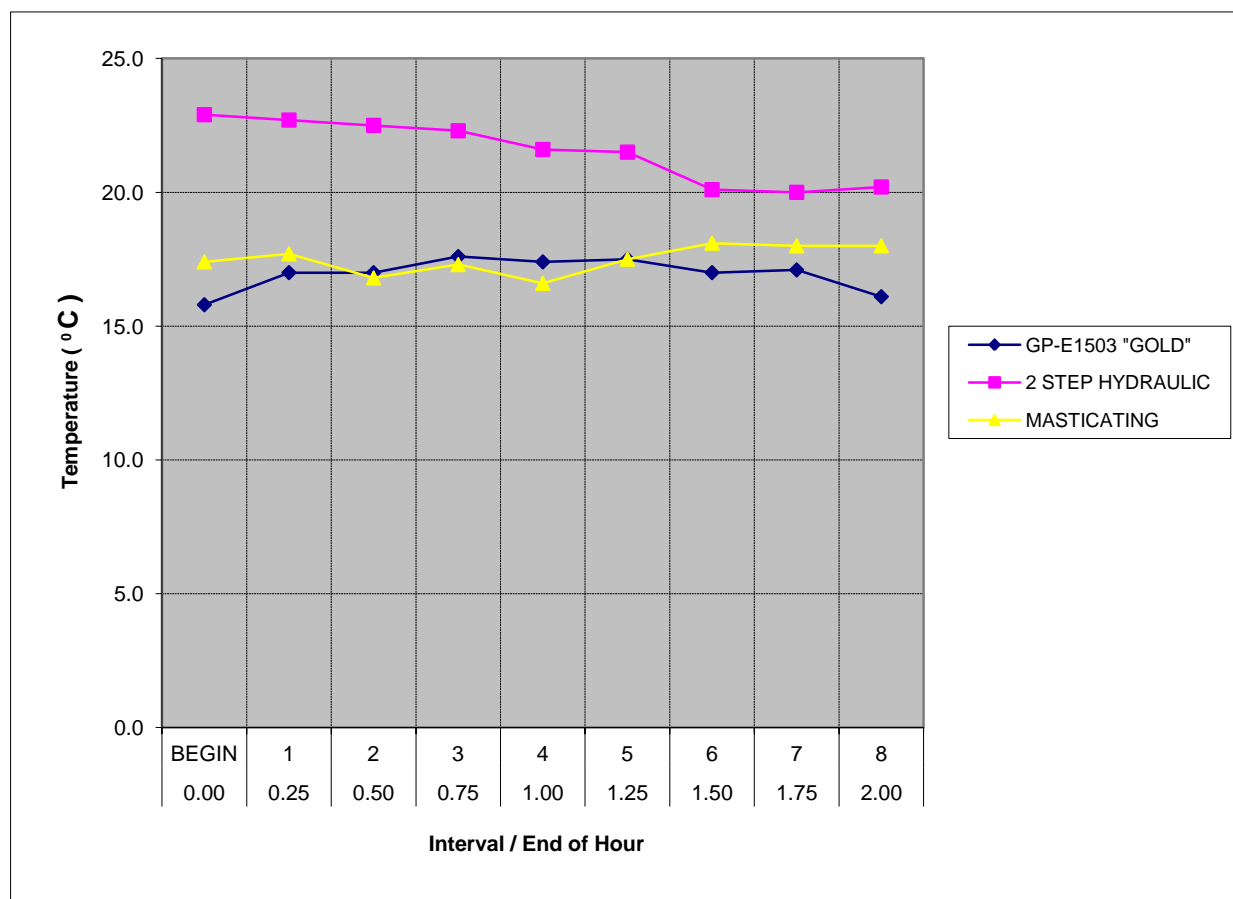
CYCLE : D

ITEM : **APPLE JUICE**

PARAMETERS : 3 JUICERS: GP-E1503 "GOLD", 2-STEP HYDRAULIC, MASTICATING

## TEMPERATURE ( ° C )

END OF HOUR	0.00	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00
INTERVAL	BEGIN	1	2	3	4	5	6	7	8
GP-E1503 "GOLD"	15.8	17.0	17.0	17.6	17.4	17.5	17.0	17.1	16.1
2 STEP HYDRAULIC	22.9	22.7	22.5	22.3	21.6	21.5	20.1	20.0	20.2
MASTICATING	17.4	17.7	16.8	17.3	16.6	17.5	18.1	18.0	18.0



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STUDY DATA : FRESH JUICE STABILITY STUDY

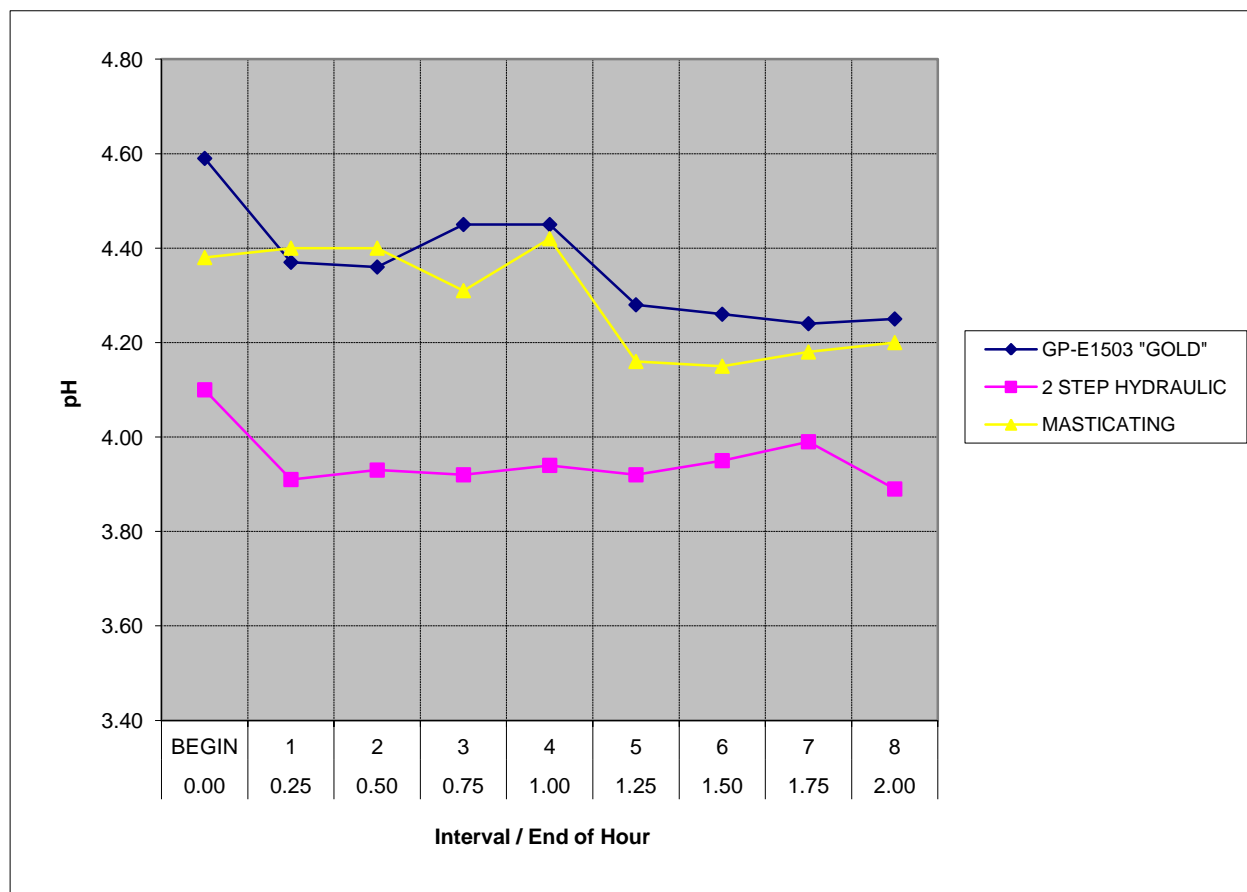
CYCLE : D

ITEM : **APPLE JUICE**

PARAMETERS : 3 JUICERS: GP-E1503 "GOLD", 2-STEP HYDRAULIC, MASTICATING

## pH

END OF HOUR INTERVAL	0.00 BEGIN	0.25 1	0.50 2	0.75 3	1.00 4	1.25 5	1.50 6	1.75 7	2.00 8
GP-E1503 "GOLD"	4.59	4.37	4.36	4.45	4.45	4.28	4.26	4.24	4.25
2 STEP HYDRAULIC	4.10	3.91	3.93	3.92	3.94	3.92	3.95	3.99	3.89
MASTICATING	4.38	4.40	4.40	4.31	4.42	4.16	4.15	4.18	4.20





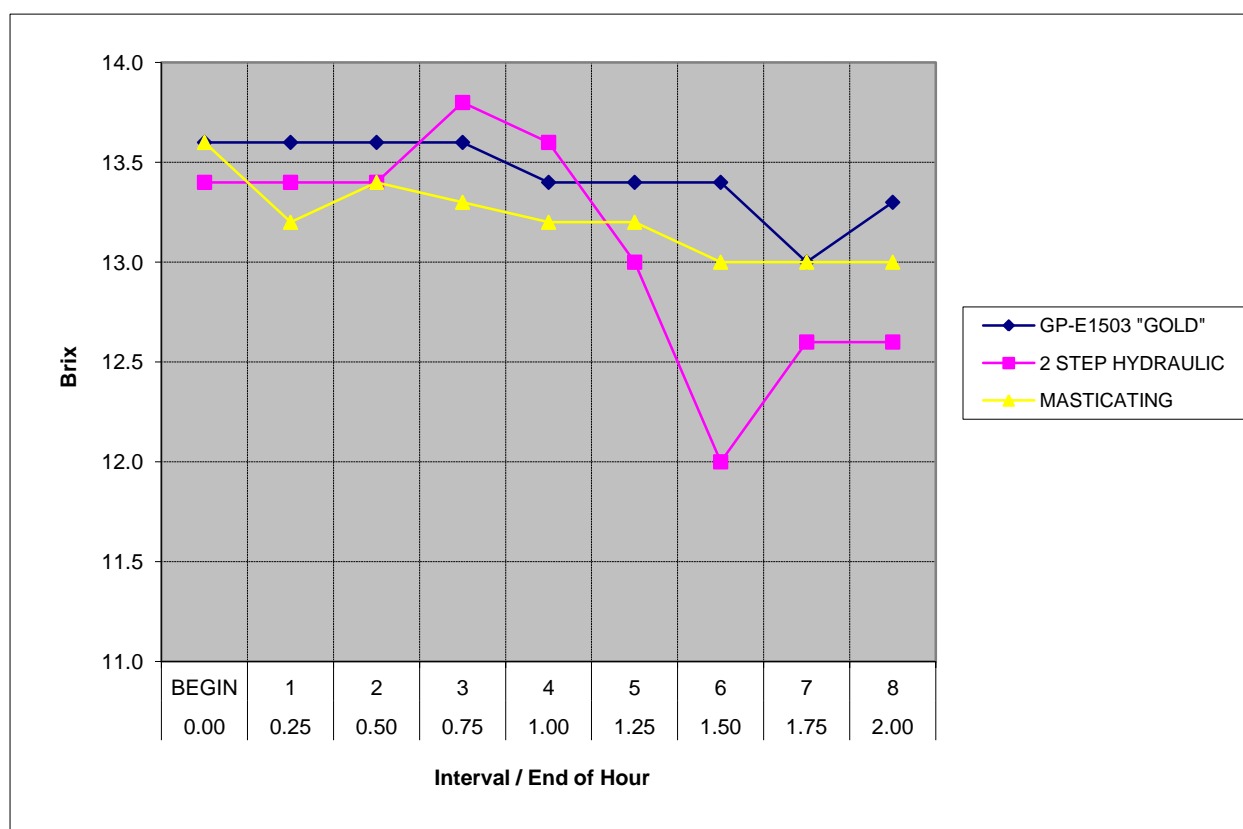
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Phone : 541-885-8804

STUDY DATA : FRESH JUICE STABILITY STUDY  
CYCLE : D  
ITEM : **APPLE JUICE**  
PARAMETERS : 3 JUICERS: GP-E1503 "GOLD", 2-STEP HYDRAULIC, MASTICATING

## CARBOHYDRATE INDEX

END OF HOUR INTERVAL	0.00 BEGIN	0.25 1	0.50 2	0.75 3	1.00 4	1.25 5	1.50 6	1.75 7	2.00 8
GP-E1503 "GOLD"	13.6	13.6	13.6	13.6	13.4	13.4	13.4	13.0	13.3
2 STEP HYDRAULIC	13.4	13.4	13.4	13.8	13.6	13.0	12.0	12.6	12.6
MASTICATING	13.6	13.2	13.4	13.3	13.2	13.2	13.0	13.0	13.0



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Dr. E. Waselus, M.D.,Ph.D.  
Director

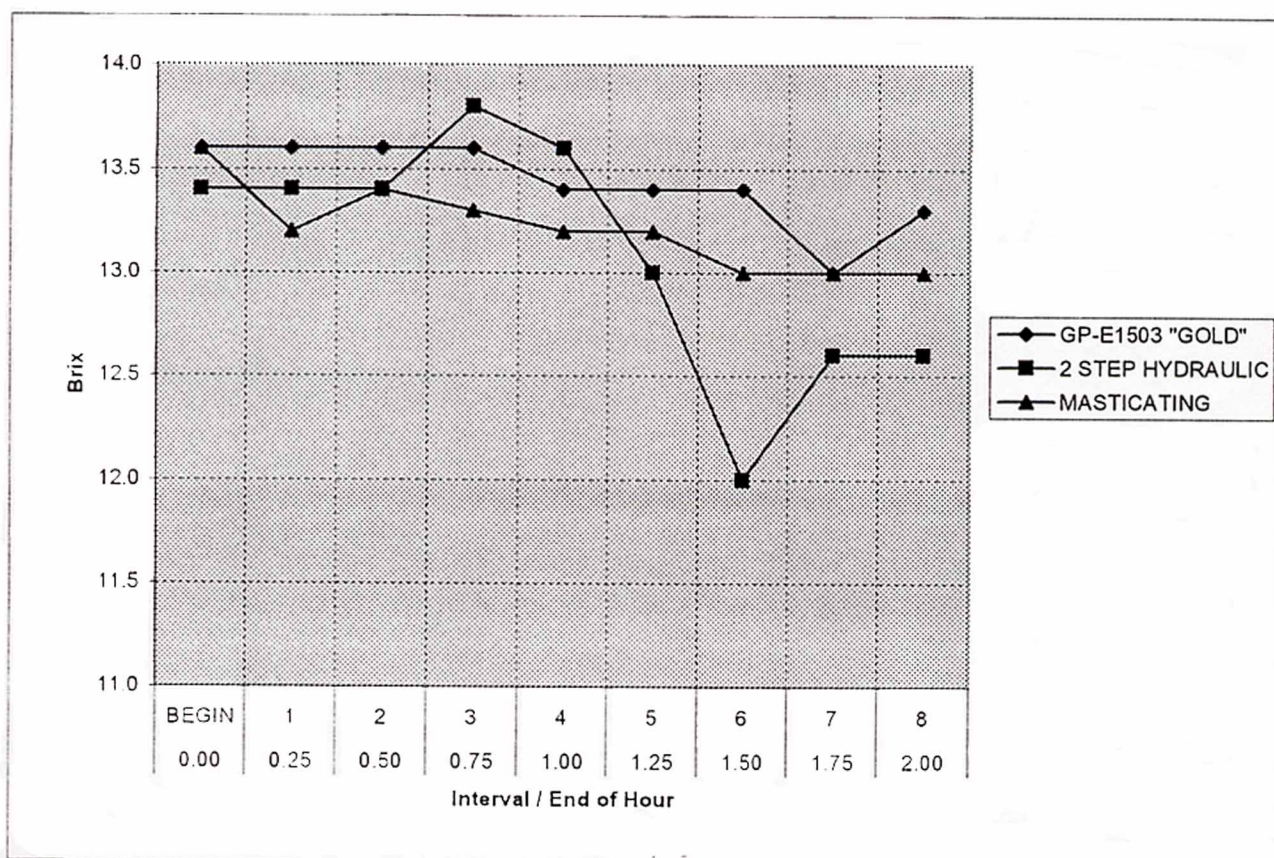
# BIOlogical Research

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Klamath Falls, OR 97601  
Phone : 541-885-8804

STUDY DATA : FRESH JUICE STABILITY STUDY  
CYCLE : D  
ITEM : APPLE JUICE  
PARAMETERS : 3 JUICERS: GP-E1503 "GOLD", 2-STEP HYDRAULIC, MASTICATING

## CARBOHYDRATE INDEX

END OF HOUR INTERVAL	0.00 BEGIN	0.25 1	0.50 2	0.75 3	1.00 4	1.25 5	1.50 6	1.75 7	2.00 8
GP-E1503 "GOLD"	13.6	13.6	13.6	13.6	13.4	13.4	13.4	13.0	13.3
2 STEP HYDRAULIC	13.4	13.4	13.4	13.8	13.6	13.0	12.0	12.6	12.6
MASTICATING	13.6	13.2	13.4	13.3	13.2	13.2	13.0	13.0	13.0



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*E. Waselus*

Dr. E. Waselus, M.D., Ph.D.  
Director

# ANAMOL LABORATORIES LTD.

83 CITATION DRIVE, UNIT 9  
CONCORD, ONTARIO L4K 2S4

January 23, 1995

## "GREEN JUICE" TEST RESULT

MINERAL CONTENT: mcg/ml

	* C	* C + P	* N	Green Power GPE-1503 "Gold"
Minerals				
Boron	0.71	0.8	0.83	0.89
Calcium	382	312	324	580
Chromium	0.005	0.022	ND	0.095
Cobalt	ND	ND	ND	ND
Copper	1.31	1.4	1.37	1.17
Iron	3.21	2.7	2.5	6.58
Lithium	0.096	0.13	0.16	0.18
Magnesium	197	241	257	291
Manganese	2.4	2.34	2.988	3.33
Molybdenum	0.052	0.049	0.037	0.065
Nickel	0.096	0.072	0.055	0.077
Phosphorus	365	300	313	331
Potassium	1847	2258	2302	2236
Selenium	ND	ND	ND	ND
Silicon	ND	ND	ND	2.05
Sodium	658	759.6	838	948
Strontium	0.67	0.55	0.62	1.08
Vanadium	0.006	0.01	0.01	0.014
Zinc	1.87	2.18	2.29	2.92

VOLUME: cc

	* C	* C + P	* N	Green Power GPE-1503 "Gold"
GREEN JUICE	600	780	790	800

VEGETABLE USED:


VEGETABLE	Celery	Kale	Parslay	Chard	Sunflower sprouts	Total
QUANTITY	300g	392g	64g	270g	160g	1,186g

\* C : Masticating Juicer

\* C + P : Masticating Juicer as a Grinder and Press

\* N : Two Step Hydraulic Press Juicer

Anamol Laboratories, LTD



George M. Tamari, Ph.D.

\* Brand name has been left out from the original report. This report became available for use in U.S.A. by the courtesy of Teldon of Canada, Vancouver, B.C., Canada

# BIOlogical Research

P.O. Box 1136

Klamath Falls, OR 97601

February 20, 1997

Tribest Corp.

12020 Woodruff Ave., Ste. C

Downey, CA 90241

Dear Mr. Choi,

The following are the results of the Sound and Electromagnetic Field Testing.

Sound Magnitude Testing Procedure : Measure the volume of sound emitted:  
1. 24 inches from the juicing machine, at ear level for a 5'6" person; 2.  
15 feet from the juicing machine. Measurements are to be conducted on four  
different juicing machines: Champion, Acme, Norwalk and Green Power GPE-1503  
(Gold Model). The recordation of data is to be based upon the collection of three  
readings at each location, using 90 degrees axes where the sound registers  
maximum. The scores to then be computed to get the resultant which is used as the  
recorded data. The testing site to be a sound specified room.

<u>JUICING MACHINE</u>		<u>SOUND (decibels)</u>	
		24"	15'
Acme	...	70	61
Champion	...	66	62
Norwalk	...	71	62
Green Power GPE-1503	...	61	51

Electromagnetic Field Testing Procedure: Measure the gauss emission at 6 inches  
from the juicing machines. Measurements are to be collected to four different juicing  
machines: Champion, Acme, Norwalk, Green Power GPE-1503 (Gold model). Three  
readings to be taken at the point of highest reading, then computed to determine the  
resultant to be recorded. The testing site to be a magnetically shielded room.

<u>JUICING MACHINE</u>	<u>ELECTROMAGNETIC FIELD EMISSION (milligauss)</u>
Acme	... 113
Champion	... 51
Norwalk	... 1253
Green Power GPE-1503	... 21

Submitted: *P. Christland, ND.*  
Dated: February 20, 1997

Research  
Report

A Study for comparison of Hygienic Property, Efficiency  
on Extraction, Removal effect for Pesticides or Heavy metals  
with Green Power Juice Extractor

1994. 4. 12.

Korea Institute of Science & Technology  
Advanced Analysis Center

## 1. INTRODUCTION

Positive effects of vegetable juice on a disease caused by modern pollutants and stress were confirmed by many people. Unfortunately, there were some cases that Juice extractor generated lots of impurities or extraction ratio was not satisfactory. At the same time removal efficiency of pesticides or heavy metals with juice extractor were curious question among the users. Therefore, in this research we measured the concentration of impurities, Fe, Ni, Pb, Cr from the juice extractors including the efficiency of extraction at Kayle or Sincerncho. Furthermore the amount of residual pesticides or heavy metals in juice and the residues with Green Power Juice Extractor I, II were determined for better understanding the merits of extractors.

## 2. The purpose of experiment

The amount of heavy metals (Fe, Ni, Pb, Cr) pulverized from a grinding mill at juice extractor during operation without vegetables were measured and compared. Also, the extraction ratios of vegetables were determined with Kayle and Sincerncho squeezed through extractors. The residual level of pesticides (parathion, diazinon) on juice of grouts after addition of 5ppm pesticide were analyzed by GLC. As the similar procedure 50ppm heavy metals (Cd, Pb, Cr) were sprayed on vegetables for the measurement of removal effect by extractor.

## 3. METHOD

### a. Measurement of impurities from extractor

Extractor was cleaned with distilled water and then dried after being operated at unloaded state for 10 minutes followed by another operation at unloaded state for 30 minutes. The extractor was washed out with 100mL distilled water for the determination of total Fe, Ni, Pb, Cr.

### b. Measurement of Efficiency on Extractor

Five hundred gram of 3-5 cm fresh Kayle and Sincerncho were introduced through extractor.

Extraction efficiency is defined as weight percent of the juice over the total weight of output through extractor.

### c. Determination of residual pesticides

Five ppm diazinon and parathion were added to Kayle and

Sincerncho cut into 3-5cm in length. After passage of sample through extractors, the concentration of pesticides in juice and residues were analyzed.

d. Determination of residual heavy metals

The metal standard solutions(Cd,Pb,Cr) at 50ppm were added to Kayle and Sincerncho. After air drying for 1 day, 500gr of those were ground through juice extractor.

Heavy metals in juice and residue were analyzed by Atomic Absorption Spectrometer or ICP-AES.

#### 4. RESULTS

The results of experiment are listed as follow;

a. Measurement of Impurities from extractor

(unit : mg)

Juice Extractor	EXP. No.	Fe	Ni	Pb	Cr	cf
A Co. product	A-0	10.95	1.54	<0.02	2.74	
B Co. product	B-0	4.08	0.41	<0.02	1.04	
Green Power I	C-0	0.06	<0.01	<0.02	0.01	
Green Power II	D-0	0.08	<0.01	<0.02	0.02	

**b. Determination of Extraction Efficiency**  
(Dried for 1 day)

(sample: Kayle, unit: %)

Juice Extractor	EXP. No.	Residue	Juice	Total	Residue x100/tot.	Juice x 100/tot.	Avg.
A Co. product	A-1	14.2	75.3	89.5	15.9	84.1	83.1
	A-2	15.8	70.9	86.7	18.2	81.8	
	A-3	14.9	74.1	89.0	16.7	83.3	
B Co. product	B-1	25.1	70.1	95.2	26.4	73.6	69.4
	B-2	27.6	59.1	86.7	31.8	68.2	
	B-3	30.9	61.3	92.2	33.5	66.5	
Green Power I	C-1	7.5	78.2	85.6	8.8	91.2	87.2
	C-2	12.1	72.9	85.0	14.2	85.8	
	C-3	13.2	72.1	85.3	15.5	84.5	
Green Power II	D-1	7.7	81.5	89.2	8.6	91.4	87.1
	D-2	12.6	75.3	87.9	14.3	85.7	
	D-3	13.5	71.9	85.4	15.8	84.2	

(sample: Sincerncho, unit: %)

Juice Extractor	EXP. No.	Residue	Juice	Total	Residue x 100/tot.	Juice x100/tot.	Avg.
A Co. product	A-1	10.7	74.2	84.9	12.6	87.4	86.4
	A-2	14.6	85.2	99.8	14.6	85.4	
	A-3	13.3	84.6	97.9	13.6	86.4	
B Co. product	B-1	16.0	72.3	88.3	18.1	81.9	79.4
	B-2	23.8	74.8	98.6	24.1	75.9	
	B-3	19.6	80.4	100	19.6	80.4	
Green Power I	C-1	8.2	78.0	86.2	9.5	90.5	88.1
	C-2	12.5	84.3	96.8	12.9	87.1	
	C-3	13.2	86.6	99.8	13.2	86.8	
Green Power II	D-1	9.2	77.3	86.5	10.6	89.4	87.3
	D-2	13.1	85.5	98.6	13.3	86.7	
	D-3	14.0	85.5	99.5	14.1	85.9	



**c. Determination of Residual Pesticides**  
(after addition of 5ppm pesticides)

(sample: Kayle, Unit: ppm)

Juice Extractor	EXP. No.	Residue		Juice		cf.
		diazinon	Parathion	diazinon	parathion	
A Co. product	A-1	< 0.01	< 0.01	< 0.01	< 0.01	
	A-2	8.65	10.81	2.63	2.54	
	A-3	10.30	12.10	2.31	2.67	
B Co. Product	B-1	< 0.01	< 0.01	< 0.01	< 0.01	
	B-2	7.24	8.27	2.26	2.41	
	B-3	6.69	8.44	2.63	2.87	
Green Power I	C-1	< 0.01	< 0.01	< 0.01	< 0.01	
	C-2	7.34	9.56	1.92	2.18	
	C-3	11.93	15.08	1.95	2.11	
Green Power II	D-1	< 0.01	< 0.01	< 0.01	< 0.01	
	D-2	11.85	14.65	1.85	2.23	
	D-3	12.43	15.44	1.96	2.30	

\* Addition of average 5ppm pesticides

\* 1: blank

2,3: 5ppm (parathion, diazinon) addition

(unit : ppm)

Juice Extractor	EXP. No.	Residue		Juice		cf.
		diazinon	parathion	diazinon	parathion	
A Co. product	A-1	<0.01	< 0.01	< 0.01	< 0.01	
	A-2	14.3	17.24	2.54	2.82	
	A-3	16.93	18.88	2.18	2.34	
B Co. product	B-1	<0.01	< 0.01	< 0.01	< 0.01	
	B-2	11.92	14.35	3.00	3.24	
	B-3	11.43	14.02	3.14	4.22	
Green Power I	C-1	<0.01	< 0.01	< 0.01	< 0.01	
	C-2	15.28	17.59	2.30	2.84	
	C-3	15.74	18.63	2.14	3.06	
Green Power II	D-1	<0.01	< 0.01	< 0.01	< 0.01	
	D-2	16.49	17.90	2.43	3.24	
	D-3	13.65	15.86	1.82	2.62	

1. The concentration of heavy metals were determined after addition of 5ppm standards(#2,3) or without standard(#1) followed by drying for 1 day before using extractors
2. sample: Sincerncho

d. Measurement of Residual Heavy Metals  
(Air drying for 1 day)

(sample : Kayle, unit : ppm)

Juice Extractor	EXP. No.	Residue				Juice				cf.
		components				components				
		Fe	Ni	Pb	Cr	Fe	Ni	Pb	Cr	
A Co. -Product	A-1	30	2.3	< 2	3.1	24	2.1	< 1	4.5	
	A-2	140	52	43	75	40	43	52	50	
	A-3	170	62	68	97	40	65	47	78	
B Co. Product	B-1	21	1.4	< 2	1.1	29	4.0	5.9	3.2	
	B-2	130	66	52	80	44	46	56	46	
	B-3	130	65	57	76	44	44	53	49	
Green Power I	C-1	23	1.8	< 2	1.2	12	<1.0	6.0	1.1	
	C-2	120	46	44	62	44	39	51	40	
	C-3	180	69	56	100	52	46	57	46	
Green Power II	D-1	25	2.8	< 2	3.2	10	<1.0	2.7	1.0	
	D-2	160	66	45	91	42	41	53	40	
	D-3	246	74	60	110	53	41	51	42	

1 : blank

2,3 : air dried after 50ppm addition

(unit : ppm)

(unit : ppm)										
Juice Extractor	EXP. No.	Residue				Juice				cf.
		components				components				
		Fe	Ni	Pb	Cr	Fe	Ni	Pb	Cr	
A Co. product	A-1	52	2.76	<1.0	3.98	22	1.2	<1.0	1.5	
	A-2	168	70	98.8	80.9	51	44	38	43	
	A-3	201	84	96.8	102	44	47	41	46	
B Co. product	B-1	57	3.94	<1.0	7.41	20	1.2	<1.0	1.9	
	B-2	119	60	51.8	61.9	52	44	46	45	
	B-3	148	64	77.4	72.4	49	49	42	49	
Green . Power I	C-1	38	1.05	<1.0	1.1	15	0.45	<1.0	0.5	
	C-2	182	67	110	82.3	48	43	33	44	
	C-3	184	70	103	91.0	47	46	38	47	
Green Power II	D-1	41	0.75	<1.0	0.62	16	0.42	<1.0	0.5	
	D-2	165	61	72.1	75.5	48	44	43	46	
	D-3	191	72	89.3	91.1	54	47	43	48	

1. The concentration of heavy metals were determined after addition of 50ppm standards(#2,3) or without standard(#1) followed by drying for 1 day before using extractors

2. sample: Sincerncho.