A BRAZIL NUT A DAY
Keeps the Dietitian away!

Eileen Carolan RD and Brianna Hawkins RD  #BCKD2015
Nutrition in the News

PALEO

GMO

Gluten free

Vegetarian

Weight watchers

High Fiber

DETROX

Low carbohydrate
Nephro-protection

“To delay progression of kidney disease”
Acidosis is BAD

- Common complication of CKD
- Leads to CKD progression
- Sodium bicarbonate supplements may reduce CKD progression
Role of dietitian?

Base producing:
• Apples
• Apricots
• Oranges
• Peaches
• Pears
• Raisins
• Strawberries
• Carrots
• Cauliflower
• Eggplant
• Lettuce
• Potatoes
• Spinach
• Tomato
• Zucchini

Image by stockimages at freedigitalphotos.net
Phosphorus

• Phosphorus retention begins early in CKD

• Risk factor for morbidity and mortality in both patients on dialysis and with CKD

• Found in both organic and inorganic forms.
Reducing phosphorus content

PO4

Boil 10-20 minutes
Sodium

- 5% added while cooking
- 12% from natural sources
- 6% added while eating
- 77% from processed and prepared foods
  - packaged foods
  - canned foods
  - restaurant foods
AGE (Advanced Glycolation End Products)

Kidneys help maintain AGE homeostasis

Studies suggest that an AGE-restricted diet reduces inflammation

Limiting AGE formation may slow progression of disease

AGE’s are BAD
Low AGE diet

No amount of antioxidants can touch oxidative load of AGE.
# AGE

**Comparison of AGE content (90 g hamburger)**

<table>
<thead>
<tr>
<th>Method</th>
<th>AGE Content (kU)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOILED</td>
<td>1400 kU</td>
</tr>
<tr>
<td>MARINATED</td>
<td>3500 kU</td>
</tr>
<tr>
<td>BROWNED</td>
<td>4900 kU</td>
</tr>
</tbody>
</table>
Malnutrition Inflammation Complex Syndrome

Incidence of malnutrition:
- 20 – 25 % CKD
- more than 40% hemodialysis
- 18 – 50 % peritoneal dialysis
Causes of Wasting

- Loss of Appetite
- Diet Restrictions
- Nutrient Loss
- Hypercatabolism
- Inflammation
What’s New?

- Appetite
- Anti-oxidants
- Fibre & Probiotics
Appetite

Brain problems
- leptins = satiety hormone
- ghrelin = hunger hormone

Gastric problems
- motility disorders
- delayed gastric emptying
- gastric distension

Oral problems
- taste changes
- dry mouth
- decayed or missing teeth
Are you bothered?

To what extent during the last 4 weeks were you bothered by the following?

Lack of appetite?

1. not bothered
2. very bothered

1. not bothered
2. very bothered

3. not bothered
4. very bothered

5. not bothered

very bothered
Appetite

- 18% not bothered
- 53% somewhat bothered
- 20% moderately bothered
- 6% very bothered
- 3% extremely bothered
To eat or not to eat?

- Loss of 1-3 kg LBM /year
- Missed meals
- Reduced energy
Supplements

- 27 g soy or whey protein during dialysis
- Reduced inflammation
- Improved gait speed.

image by Rawich at DigitalPhotos.net
Oxidative Stress

Oxidative stress causes tissue damage and cardiovascular disease.

When a stable molecule loses an electron it becomes a free radical.
Oxidative Stress

Free Radical

cancer
aging
cardiovascular disease
diabetes

Images by xedoS4 and MisterGC at FreeDigitalPhotos.net
Antioxidants

• Brazil Nuts

1 Brazil nut (5g) contains:
96 mcg Selenium
36 mg Phosphorus
34 mg Potassium
## Brazil nuts

<table>
<thead>
<tr>
<th>Food</th>
<th>Selenium mcg</th>
<th>Phosphorus mg</th>
<th>Potassium mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil nut raw (20 nuts)</td>
<td><strong>Canada 1917</strong></td>
<td>725</td>
<td>669</td>
</tr>
<tr>
<td></td>
<td><strong>Brazil 5800</strong>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pork kidney braised</td>
<td>311</td>
<td>240</td>
<td>143</td>
</tr>
<tr>
<td>Turkey cooked</td>
<td>31</td>
<td>250</td>
<td>300</td>
</tr>
</tbody>
</table>

Canadian Nutrient File August 2015
* Stockler-Pinto et al. Nutrition 26 (2010) 1065-1069
Antioxidants

- Pomegranate Juice
Pomegranate juice

Nutrient breakdown per 100 mL

<table>
<thead>
<tr>
<th></th>
<th>Energy kcal</th>
<th>Phosphorus mg</th>
<th>Potassium mg</th>
<th>Carbohydrate grams</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>58</td>
<td>12</td>
<td>225</td>
<td>14</td>
</tr>
</tbody>
</table>

Canadian Nutrient File August 2015
Fibre and Probiotics

Reduced CVD risk and reduced inflammation are related to the interaction between dietary fibre and the gut microbiome.

Image by phasinphoto at FreeDigitalPhotos.net
Fibre goal is 20 – 35 g /day

½ cup asparagus(2)
½ cup corn(2)
½ cup green peas(4)

½ cup raspberries(4)
½ cup peach(2)
½ cup stewed rhubarb(6)

2 slices whole wheat bread(4)

→ 24 grams fibre
1100 mg potassium
Bacteria in Balance

**Commensals**
- Inhibit pathogen growth
- Stimulate immune function
- Stimulate gut motility

**Pathogens**
- Sepsis, infection
- Inflammation
- Diarrhea, constipation
Is there anything left to eat?
Potassium free meal!!

Image by Master isolate image at FreeDigitalPhotos.net
Protein- A balancing act

image by Master isolate image at FreeDigitalPhotos.net
## Protein

<table>
<thead>
<tr>
<th>Recommended protein for CKD:</th>
<th>Recommended protein for dialysis:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.8-1 g/kg 60-70% high biological value</td>
<td>1.2-1.4 g/kg 60-70% high biological value</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>56-70 g protein/day*</th>
<th>84-98 g protein/day*</th>
</tr>
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</table>

<table>
<thead>
<tr>
<th>6 oz HBV protein translates to:</th>
<th>9 oz HBV protein translates to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 oz meat</td>
<td>6-7 oz meat</td>
</tr>
<tr>
<td>1 egg</td>
<td>2 eggs</td>
</tr>
<tr>
<td>1 cup milk</td>
<td>½ cup milk</td>
</tr>
</tbody>
</table>

*Based on 70 kg person
Tailoring message
Thank you!

Life expectancy would grow by leaps and bounds if green vegetables smelled as good as bacon!


References

**Acidosis**


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Protein
