Zebra: more than just stripes

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Outline

• Subspecies
• Typical uses
• Consumer expectations
• Carcass composition & yields
• Meat quality
• Value addition
• Conclusions
• Recommendations
Introduction

• **Zebra: 4 sub-species**
  
  – *Equus grevyi* (Grevy's zebra)
  
  – *Equus hartmannae* (Hartmann's zebra, Hartmann's mountain zebra)
  
  – *Equus zebra* (Cape mountain zebra, Mountain zebra)
  
  – *Equus quagga* (Plains zebra)
Equus grevyi
(Grevy’s zebra)

Source: www.nature.ca
Equus grevyi
(Grevy’s zebra)
Equus hartmannae
(Hartmann’s mountain zebra)

Source: www.flickr.com
Equus hartmannae
(Hartmann’s mountain zebra)
Equus zebra
(Cape mountain zebra)
Equus zebra
(Cape mountain zebra)
Equus quagga
(Plains zebra)

Source: commons.wikimedia.org
Equus quagga
(Plains zebra)
This project, started in 1987, is an attempt by a group of dedicated people in South Africa to bring back an animal from extinction and reintroduce it into reserves in its former habitat.

Read | Haley Harvey Back to Life pdf 216kb

DNA analysis has shown that the Quagga was not a separate species of zebra but in fact a subspecies of the Plains Zebra (Equus Quagga) The Quagga, formerly inhabited the Karoo and southern Free State of South Africa. Like other grazing mammals, Quaggas had been ruthlessly hunted. They were seen by the settlers as competitors for the grazing of their livestock, mainly sheep and goats.

By selective breeding from a selected founder population of southern Plains Zebras an attempt is being made to retrieve at least the genes responsible for the Quagga's characteristic striping.
Typical uses of zebra

- Historical & modern
Uses

Skin

33-37% of the total value

9% of live weight
Uses
Potential as meat

• Biology
  – Breed well
  – Stallion & harem of mares
  – Stallion may kill foals

• Harvest
  – Plains game – easy
  – Found in large units, economically viable

• Diseases
  – Does not get Foot & Mouth Disease
Consumer expectations

• Meat should be:
  – Healthy
  – Wholesome
  – Produced ethically
  – Contain no additives
  – Produced sustainably
  – Processable/value addition
Somes it up!

A few things about our

Burgers

They are cooked to order
Which might take a little longer
but it's worth the wait

Speaking of that, your selected 200g is what you get on your plate (give or take)

Our South African beef is damn good

Antibiotic free with no added hormones

(never never never never never never never ever ever ever ever beef)

It's one hundred naturally raised and percent humanely handled

We prefer medium but if you like it mooing charred or somewhere in between
The Zebra

• Harvested in field
  – Boma
  – From helicopter
  – From specialised motor vehicle

• Due to value of skin, transported with skin on from field to breaking/processing plant

• Data on 20 Burchell’s zebra

• Carcass weights: 106-190 kg
# Yields

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight (kg)</th>
<th>Yield (% of CCWt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live weight</td>
<td>321.6</td>
<td></td>
</tr>
<tr>
<td>Cold carcass weight (CCWt)</td>
<td>193.2</td>
<td></td>
</tr>
<tr>
<td>Dress out %</td>
<td></td>
<td>60.1</td>
</tr>
<tr>
<td>Hind quarters</td>
<td>66.3</td>
<td>34.3</td>
</tr>
<tr>
<td>Fore quarters</td>
<td>36.6</td>
<td>18.9</td>
</tr>
<tr>
<td>Ribs</td>
<td>29.2</td>
<td>15.1</td>
</tr>
<tr>
<td>Middle</td>
<td>45.4</td>
<td>23.5</td>
</tr>
<tr>
<td>Neck</td>
<td>15.7</td>
<td>8.1</td>
</tr>
</tbody>
</table>
Yields

- Data on 20 Burchell’s zebra
- Carcass weights: 106-190 kg
- *Longissimus dorsi* muscle removed
  - Homogenised
  - Chemically analysed using standard procedures
Proximate composition (g per 100 g) of *longissimus lumborum* muscle of zebra

*(n=20)*

<table>
<thead>
<tr>
<th>Proximate</th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture</td>
<td>76.4 ± 0.77</td>
<td>74.41–77.90</td>
</tr>
<tr>
<td>Protein</td>
<td>22.3 ± 0.50</td>
<td>21.39–23.30</td>
</tr>
<tr>
<td>Fat</td>
<td>1.5 ± 0.47</td>
<td>1.03–3.10</td>
</tr>
<tr>
<td>Ash</td>
<td>1.1 ± 0.07</td>
<td>1.01–1.26</td>
</tr>
</tbody>
</table>

SD, standard deviation.
Fatty acids

• Hind gut fermenters
• Expect FA profile to be similar to that of diet
  – The FA content of grasses is fairly low:
    • C18 polyunsaturated fatty acids (PUFAs) generally dominate in the form of $\alpha$-linolenic acid (ALA; C18:3n-3) and linoleic acid (LA; C18:2n-6), with palmitic acid (C16:0) forming a smaller proportion.
Fatty acids (IMF)

- PUFAs: 5.86 mg g$^{-1}$, 41.15%
- SFAs: 5.84 mg g$^{-1}$, 41.01%
- MUFAs: 2.75 mg g$^{-1}$, 17.84%
  - palmitic acid (C16:0; 3.48 mg g$^{-1}$, 24.03%),
  - LA (C18:2\textit{n-6}; 3.27 mg g$^{-1}$, 23.41%),
  - oleic acid (C18:1\textit{n-9}; 2.45 mg g$^{-1}$, 15.88%),
  - stearic acid (C18:0; 1.96 mg g$^{-1}$, 14.06%)
  - ALA (C18:3\textit{n-3}; 1.77 mg g$^{-1}$, 11.78%)
- EPA & DHA low but higher than in beef, lamb, pork, chicken
Processing of Zebra

- Compared salami produced from springbok (*Antidorcas marsupialis*), gemsbok (*Oryx gazella*), kudu (*Tragelaphus strepsiceros*) and zebra (*Equus burchelli*) harvested in Namibia.
• pH of the salami differed \((p<0.05)\) with springbok salami having the highest mean pH value.

• No differences \((p>0.05)\) were observed among the species for aw, shear force, gumminess or cohesiveness.

• The most distinctive characteristics DSA: smoky, salty, pepper and salami flavour, combined with a smoky, salami aroma.
  
  – Game flavour was not perceived as a strong attribute

• Gemsbok salami was strongly associated with the attribute colour as described by the male and female consumer panels.

• The springbok salami scored the lowest for both colour and taste.

• Salami produced from gemsbok, kudu and zebra were superior to springbok salami.
Conclusions

• Zebra is of the healthiest meat tested
• Ideal for value addition
Thank you

- **Papers cited:**

- **Any Questions?**