Hazard identification and characterisation for quality control of biltong through application of appropriate microbiology and biotechnology methods

E van Zyl, C McCrindle

Faculty of Veterinary Sciences
BACKGROUND

• Biltong - South African tradition.
• Derived from beef and game meat.
• Now consumed globally
• Seminal research - 40 years ago 
  (Van der Riet, 1976; Bokkenheuser, 1963; Van den Heever, 1970)
• Raw, dried, salted meat product, often flavoured with spices
What is Biltong?

• Traditional salted, dried, raw meat product
• 1851, before the Great Trek
• Hunters – preserved game meat
• Different spices added
• Family secret recipes
Quality control and safety

- Meat Safety Act, Act 40 of 2000
- Foodstuffs, Cosmetics and Disinfectants Act, Act 54 of 1972
- Export - inspected, sampled and tested
- Substitution - Identify the species origin
- Effective way to monitor meat sold
Is it made of beef or bush meat?
Objectives

• Draw a value chain for biltong
• Assess the microbiological safety and labelling (PCR) of beef biltong
• Examine opportunities for processing and marketing by small scale cattle farmers.
• Improve nutritional security for consumers with a protein rich product with a long shelf life
Methods

- Processing pathways for biltong drawn
- HAS used at point of sale through direct observation, hygiene audits and structured interviews with vendors.
- Samples were purchased and indicator organisms cultured in accordance with the national standards for testing of meat in South using 3M Petrifilm Plate
- Market research at a taxi rank (n=200)
- Participatory group discussions were held with farmers (n=23)
- Economic modelling based on participatory methods
Table 1. Odds ratio for positive growth for heterophyllic plate count (TPC)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Odds ratio</th>
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<tbody>
<tr>
<td>Handled (vs. not handled)</td>
<td>1.24</td>
</tr>
<tr>
<td>Wet (vs. dry)</td>
<td>2.11</td>
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<tr>
<td>Packaged in paper bag (vs. plastic bag or vacuum pack)</td>
<td>2.75</td>
</tr>
<tr>
<td>Ready sliced (vs. hanging)</td>
<td>1.48</td>
</tr>
<tr>
<td>Biltong sourced from biltong kiosk (vs. other outlet type)</td>
<td>2.00</td>
</tr>
<tr>
<td>Biltong sourced from retail butcher (vs. other outlet type)</td>
<td>0.65</td>
</tr>
<tr>
<td>Biltong sourced from supermarket (vs. other outlet type)</td>
<td>0.94</td>
</tr>
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ABATTOIR

Cost of meat R 22/kg
Weight per carcass: 250 kg
Distance 50 km
Cost R 3.5/km

DRYING FACILITY

Cost of preparation R 1.50/kg
Cost to use facility R 1.50/kg
Weight loss during drying: 40%
Distance 50 km
Cost R 3.5/km

RETAIL

Cost of sales (manpower etc) as a % of sales price: 10%
Package size: 100g
Package price: R15.00

INCOME

Gross income from sales (R/car cass) R 22 500
Cost per carcass R 8 850
Nett income per carcass R 13 650
Nett income per kg meat R 54.60

KEY

Focus group response