2012 Flystrike R & D

Technical Update

SkinTraction®
An intradermal alternative to mulesing

Peter St Vincent Welch
R&D Director
Cobbett Technologies Pty Ltd
The Challenge
Develop an low stress method to modify the breech of sheep

- Increase breech bare area
- Increase tail bare area
- Reduce wrinkles
- Minimal stress to the animal
SkinTraction® an intradermal alternative

- Active – sodium lauryl sulphate (SLS)
- An anionic surfactant
- Denatures protein
  including: blood vessels, neural bundles, collagen
- Critical micellar concentration (CMC)
SLS widely used in every day life

SLS used as an

✓ an emulsifying, foaming, wetting and dispersing agent in:
  ❖ Toothpaste
  ❖ Shampoos (up to 30%)
  ❖ Creams, lotions and medical preparations

✓ Cleansing agent in cosmetics

✓ Whipping aid in dry eggs

✓ Food additive (emulsifier and thickener)

✓ Agent in Insecticides (emulsifier, wetting agent)
SkinTraction®
Mode of Action

- Damaged skin forms hard eschar (scab) after approx. 6 days
- After approx. 14 days body starts to dislodge the eschar
- After approximately 7 weeks eschar fully dislodged
- Breech modification continues until after first lambing
Modified Pulse Needlefree™ Applicator

Safety features – safety catch off, trigger held, push tubes against skin until sufficient force of tubes against skin fires applicator
SkinTraction®
Tube detail
Applicator - Replaceable insert

✓ Need Uniform pressure of tubes against skin surface
Critical applicator settings

Tube

- Number of tubes per head and spacing
- Pressure of tube against skin surface
- Optimal OD and ID determined
Critical Applicator settings
Pressure

- Press tubes against skin surface results in the skin being pre-tensioned
- When 40N force achieved applicator activated
- Hydraulic pressure causes the chemical to penetrate the skin
Critical Applicator settings

Volume

- Volume injected per shot
- Volume injected per tube
Pattern of application

- P1  
- P11  
- P13

Recommended pattern
SkinTraction® Field trials

Aim of field trials:

- Maximise Breech modification
  - Breech bare area
  - Tail bare area
  - Reduce wrinkle count

- Minimise stress to the animal
- Consistent and repeatable trial results across merino types and environments
Correlation AWI/CSIRO Wrinkle Score verse SkinTraction Wrinkle Count

![Graph showing correlation between Wrinkles - Means and CSIRO score for Rams and Ewes. Rams (174) and Ewes (159).]
Measuring pain/stress

Lomax score range 1 to 5 (being death)

Weighted mean stress score = \[\frac{[#1 \times 1] + [#2 \times 2] + [#3 \times 3] + [#4 \times 4] + [#5 \times 5]}{\#\ sheep}\]
General Field Trial Protocol

1. Sheep into a cradle and legs secured
2. Sheep crutched if necessary
3. Antiseptic applied
4. SkinTracted
5. Observe sheep after treatment
6. Observe animals for approx. 3 days for stress
7. Approx. 14 days palpate breech and score eschar
8. Approx. 300 to 360 days measure breech using template
Field Trials
2008 to 2012

- Phase 1 – identified the interacting variables for the Pulse Applicator
- Phase 2 – identified volume per tube and density of tubes critical for animal welfare and breech modification
- Phase 3 – identify applicator settings
- Phase 4 – identified animal husbandry factors critical for animal and breech modification
Phase 4 Results

- The following results were 3 trials used to select the treatment protocol.

- Another 3 trials remain to be assessed at the recommended treatment protocol.
Reducing wrinkle and dag lowers flystrike risk
Yearling Age 2006-11, CSIRO J Smith

Ref: CSIRO Trial, Armidale
Correlation AWI/CSIRO Wrinkle Score verse SkinTraction Wrinkle Count

Wrinkles - Means

Mean CT count

CSIRO score

Rams (174)  Ewes (159)
Field Trial results
Phase 4
Trial A – Table of means

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Breech bare area (cm²)</th>
<th>Breech width A1,5 (cm)</th>
<th>Breech width A2,4 (cm)</th>
<th>Wrinkle count</th>
</tr>
</thead>
<tbody>
<tr>
<td>SKT (50psi)</td>
<td>37.8</td>
<td>83.6</td>
<td>70.4</td>
<td>2.0</td>
</tr>
<tr>
<td>Mulesed</td>
<td>52.6</td>
<td>101.5</td>
<td>90.0</td>
<td>1.5</td>
</tr>
<tr>
<td>Untreated</td>
<td>23.4</td>
<td>59.5</td>
<td>54.2</td>
<td>9.7</td>
</tr>
</tbody>
</table>
Field Trial results
Phase 4
Trial A - Breech bare area

![Graph showing percentage of breech bare area (cm²) for different treatments on Day 274.](chart)

- **Untreated**
- **SkinTraction**
- **Mulesed**

A national flystrike R&D technical update 1st August 2012
Field Trial results
Phase 4
Trial A - Breech width

Trial A - Day 274

<table>
<thead>
<tr>
<th>Breech bare width A1.5 (mm)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 40</td>
<td>untreated</td>
</tr>
<tr>
<td>&gt; 50</td>
<td>SkinTraction</td>
</tr>
<tr>
<td>&gt; 60</td>
<td>mulesed</td>
</tr>
<tr>
<td>&gt; 70</td>
<td></td>
</tr>
<tr>
<td>&gt; 80</td>
<td></td>
</tr>
</tbody>
</table>
Field Trial results
Phase 4
Trial A - Wrinkle Count

A national flystrike R&D technical update 1st August 2012
# Field Trial results  
## Phase 4  
### Trail B – Table of means

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Breech bare area (cm²)</th>
<th>Breech width A1,5 (cm)</th>
<th>Breech width A2,4 (cm)</th>
<th>Tail bare area</th>
<th>Wrinkle count</th>
</tr>
</thead>
<tbody>
<tr>
<td>SKT (50psi)</td>
<td>36.3</td>
<td>84.8</td>
<td>70.8</td>
<td>60.0</td>
<td>1.5</td>
</tr>
<tr>
<td>Godson mules</td>
<td>60.6</td>
<td>110.0</td>
<td>103.2</td>
<td>72.9</td>
<td>0.4</td>
</tr>
<tr>
<td>Station mules</td>
<td>35.1</td>
<td>90.0</td>
<td>72.4</td>
<td>79.2</td>
<td>3.1</td>
</tr>
<tr>
<td>Untreated</td>
<td>17.1</td>
<td>53.7</td>
<td>46.7</td>
<td>49.8</td>
<td>13.7</td>
</tr>
</tbody>
</table>
Field Trial results
Phase 4
Trail B - Breech bare area

![Chart showing Breech bare area (cm²) for different categories and treatments.]

- **Untreated**
- **SkinTraction**
- **Godson mules**
- **Station mules**
Field Trial results
Phase 4
Trial B - Breech width

Trial B - Day 259

Percentage

Breech bare width A1,5 (mm)

untreated
SkinTraction
Gordon mulesed
station mulesed
Field Trial results
Phase 4
Trial B - Wrinkle count

Trial B - Day 259

Wrinkle count

- < 3
- < 6
- < 9
- < 12
- < 18

Percentage

- Untreated
- SkinTraction
- Godson mules
- Station mules
## Field Trial results

### Phase 4

#### Trial C – Table of Means

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Breech bare area (cm²)</th>
<th>Breech width A1,5 (cm)</th>
<th>Breech width A2,4 (cm)</th>
<th>Tail bare area</th>
<th>Wrinkle count</th>
</tr>
</thead>
<tbody>
<tr>
<td>SKT (50psi)</td>
<td>31.2</td>
<td>76.0</td>
<td>62.8</td>
<td>40.6</td>
<td>1.7</td>
</tr>
<tr>
<td>Mulesed</td>
<td>51.6</td>
<td>105.5</td>
<td>90.2</td>
<td>79.3</td>
<td>0.2</td>
</tr>
<tr>
<td>Untreated</td>
<td>16.0</td>
<td>51.3</td>
<td>44.1</td>
<td>7.4</td>
<td>13.6</td>
</tr>
</tbody>
</table>
Field Trial results
Phase 4
Trial C - Breech Bare Area

Trial C - Day 406

<table>
<thead>
<tr>
<th>Breech bare area (cm²)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 10</td>
<td>untreated</td>
</tr>
<tr>
<td>&gt; 20</td>
<td>SkinTraction</td>
</tr>
<tr>
<td>&gt; 30</td>
<td>mulesed</td>
</tr>
<tr>
<td>&gt; 40</td>
<td></td>
</tr>
<tr>
<td>&gt; 50</td>
<td></td>
</tr>
</tbody>
</table>
Field Trial results
Phase 4
Trial C - Breech width

Trial C - Day 406

Breech bare width A1,5 (mm)

Percentage

untreated  SkinTraction  mulesed
Field Trial results
Phase 4
Trial C - Wrinkle count

Trial C - Day 406

Wrinkle count

Percentage

untreated  SkinTraction  mulesed

< 3  < 6  < 9  < 12  < 18
Field Trial results
Phase 4
Treatment Protocol - Applicator settings (not adjustable)

✓ Pressure set at 50psi

✓ Volume per application 1.25ml (approximately 0.08ml per tube)

✓ Number of tubes per head 16

✓ Extra spring in handpiece to increase pressure of tubes against skin surface

✓ Pattern of application # 14
Field Trial results
Phase 4
Husbandry Protocol

**Best practise protocol for Mules and SkinTraction**

- Not dehydrated – treat like unweaned lambs at marking.
- Inoculate against tetanus
- Avoid cold wet weather
- Do not treat sheep during black fly season
- Sheep must have blowfly protection during blowfly season

**Specific for SkinTraction**

- Antiseptic applied to breech before SkinTracting
- Sheep weight > 30kg
- Condition score > 2.5
- Breech wool length < 8mm
APVMA Registration

- Residue module currently under review by APVMA
- Final response to APVMA efficacy questions to be submitted after decision on residue module
SkinTraction Transition from R&D to commercialisation

Issues to be resolved

- Increase speed of application
- Training contractors
- Finalisation of commercial model.
Increased Speed of Application
Modify existing crutching trailer

- Multiple procedures on same sheep (crutch/antiseptic/SkinTract)
- Sheep move and operators remain stationary
- Incorporate overhead sheep conveyor
- Improve cradle
- Improve leg clamp
Cobbett Technologies Pty Ltd appreciates the contribution of the following:

- AWI for funding the field trials
- Wool growers in NSW, Victoria and Tasmania
- Livestock contractors association members
- Pulse NeedleFree Systems
- The late Gordon Godson for organising the trial sites and his counsel
- Dr John Ashley for statistical analysis and advice
- Katherine Russell for collating data.
2012 Flystrike R & D

Commercial Update

SkinTraction®
An intradermal alternative to mulesing

Chris Russell
Technical Director
Cobbett Technologies Pty Ltd
SkinTraction a new agricultural business

- New low stress procedure to reduce wrinkle and increase breech bare area in Merinos.
- New equipment
  - Pulse applicator
  - Portable handling system on trailer
- New procedures
- New risks - therefore
  - Training and accreditation required
  - Investment in new equipment
- New benefits
  - Welfare friendly means of reducing wrinkle and increasing breech bare area to reduce dag – CSIRO shown links to reduced fly-strike
Sheep in Australia

Average Sheep Density - sheep per hectare

- Non-Grazed Land
- Zero
- >0 - 0.01
- >0.1 - 0.5
- >0.5 - 1.0
- >1.0 - 2.0
- >2.0
Australian sheep forecast for 2012-13 is 80.5 million.

Ref: AWI - 2012
SkinTraction customers

- Wool grower
  - Price (throughput per day and cost per sheep)
  - Efficacy
  - Welfare

- SkinTractor
  - Price (income competition)
  - Effort (must be easy to use)
  - Low skill
Training of Contractors

- WH&S
- Animal welfare
- Efficacy
- Quality assurance and Quality control
- Maintenance of equipment
- Treatment protocol
- Issue of licence to SkinTract
Wool Grower

- Benefits and risks of SkinTraction
- Contractors licence
- On Line ordering - direct order from CTech
- Australia post deliver to nearest post office
- Contractor and wool grower sign off on completion (QC)
- Contractor reports back to CTech (QC)
Controlled SkinTraction rollout

- Careful selection of districts to start rollout based on
  - Merino type
  - Merino population density
  - Contractors selected

- Promotion in local districts

- Field days

- Webinars

- Contractors existing client base
Conclusion

- Ensure contractors in transition phase have a viable business (lease trailer and Pulse applicators at start-up)

- Ensure wool growers get value (cost and outcome)

- Controlled, methodical Roll out

- Select districts to start program

- Insurance/risk issues