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February 25, 2008

Mr Geoff Lindon
Program Manager, Animal Health and Welfare
Australian Wool Innovation Limited
Level 30, 580 George St
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Dear Geoff

**RE: AVA REPORT ON PROGRESS OF AWI R&D ON MULESING
ALTERNATIVES AGAINST WOOL INDUSTRY COMMITMENTS TO
INTERNATIONAL RETAILERS**

On the 31st January 2008, AVA representatives Drs David Hucker and Peter Mansell met with representative of Australian Wool Innovation Limited (AWI) to conduct the quarterly review of progress against R&D milestone commitments made to overseas retailers utilizing Australian wool.

The report detailing their findings is attached. If you require further details or clarification of any points raised please do not hesitate to contact me.

Yours sincerely,

Dr Diane Sheehan
National President

Cc	Mr Les Targ Deputy CEO Australian Wool Innovation Level 30, 580 George St SYDNEY NSW 2000	Mr Don Hamblin President WoolProducers PO Box E10 KINGSTON ACT 2604
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JANUARY 2008 REPORT BY AVA REPRESENTATIVES ON PROGRESS OF AUSTRALIAN WOOL INNOVATION (AWI) R&D ON MULESING ALTERNATIVES AGAINST WOOL INDUSTRY COMMITMENTS TO INTERNATIONAL RETAILERS

Scope of Review:

To provide an independent assessment of the AWI research program commitments to overseas retailers of clothing incorporating Australian wool.

Approach:

A desktop review of the AWI research program on mulesing alternatives was undertaken at the Sydney offices of AWI on the 31st January 2008. This review was conducted as part of the commitment to retailers of apparel and other clothing products containing Australian wool. Various reports and other documents relating to the program were presented, examined and considered in the context of the projected program progress.

Following the examination of the documents, this report was prepared by the AVA representatives Drs David Hucker and Peter Mansell.

Findings:

The research program continues to progress well against commitments made by AWI. Details of the findings against the elements of the program and projected timeframes previously presented to retailers are provided in "Interim Milestones - Attachment A". As previously, the completed programs from the time line section of the document are now attached to the end of this document under the heading "Completed Milestones – Attachment B".

As noted in earlier reviews, an important feature of this R&D program is that various prospective solutions continue to be explored in parallel. As previously reported, the project has concentrated on one company to develop the bloodless skin wrinkle removal technology (clips). Due to a failure of the animal welfare assessment, AWI has halted development of the Cetrimide based intradermal treatment but is continuing to work with a private company developing its own intradermal treatment.

The development of the clips is progressing well and the first results of the broad scale commercial trials conducted on producer's properties are indicating satisfactory performance. Some producers who have trialled the clips on their properties have been impressed with the results and have reported that they feel confident that they could cease mulesing and adopt clips as the principal means of preventing breech strike.

Importantly, recent research on the animal welfare implications of the application of the clips has demonstrated that the behavioural changes seen in lambs immediately post application is a transitory phenomenon and has been shown not to be associated with any long term pain indicators. In addition weight gains of lambs treated with clips have been close to those of untreated control lambs and well above the weight gains of surgically mulesed lambs.

The lambs born in 2006 in the long term breeding trial have been assessed for breech-strike resistance traits and these will be supplemented with measurement of production traits in late 2007. Detailed results have been published in the Nov/Dec newsletters of each site. Interim results indicate that the selection criteria based on the scoring system previously developed (December 2005), and updated since, are leading to marked differences in susceptibility to breech strike between the intensively selected lines and the control lines

Use of the post mulesing pain and haemorrhage control increased during 2007, and there is now significant awareness and concern by producers and contractors of animal welfare issues relating to mulesing. The company marketing the product increased its efforts to make producers aware of the benefits of pain control during 2007. In the October report, we made mention of four other projects previously not included in these reports. These programs, while not directly involving mulesing or its alternatives, do relate to fly control which may have some effect on the requirement for these procedures. A brief update where available on these projects occurs in **bold type**

1. Insect Growth Regulator Resistance
Project completed

2. Integrated Pest Management Systems
This project has involved 23 demonstration farms and has used consultants to provide best practice advice on animal health and production issues including management of flystrike.
An MVSc thesis which studied the ecology of blowfly larvae in soil has been submitted. Two PhD studies which surveyed the socio economic practices of fly control and the ecology of Haemonchus have been completed.

3. Fungal Biopesticide
A fungus has been identified that has some effect on the control of lice but also has some effect on flies although not at the maggot stage. A product development is being planned
Work is continuing to establish the dose required but at this point no clear dose response has been established.

4. Blowfly Genomics
Research into mapping the blowfly genome is now almost complete. This information may allow a renewed emphasis on controlling the sheep blowfly in the future. **Fly genome has now been mapped as well as it can be.**

Conclusions:

We believe that the progress made so far on the bloodless skin wrinkle removal (clips) continues to indicate that it will be a viable alternative to mulesing before the projected deadline of 2010 for the phasing out of mulesing. Although the intradermal agent has not progressed to the commercial stage at this point, it still remains an option to develop. The projects concerning the breeding of sheep that are less susceptible to breech strike have produced some very encouraging interim results and the mapping of the blowfly genome may provide a base for future research on fly control.

As stated previously, it is noted that delivery of commercially available products in a timely way will require continuing industry commitment to this R&D program and commitment on the part of commercial partners to make the mulesing alternatives commercially available to wool producers.

MULESING PHASE-OUT 2010

INTERIM MILESTONES (PROGRESS AS AT JANUARY 2008)

Appendix "A" - Active Milestones

Date	Milestone	Measure of Success	Progress against Milestones
September 2005	Bloodless skin wrinkle removal technology – limited field trials and commercial partner appointed	Trials commenced and partner appointed	<p>200 properties spread across all wool producing regions in Australia were selected from 1152 expressions of interest to cooperate in the field testing program for clips. Almost 44 000 lambs were involved in this trial. Data entry is proceeding as planned but because lambing occurs at different times across Australia, this is still proceeding. The final report is due in May 2008. Early impressions gained from producers and experienced operators indicate favourable results.</p> <p>AWI and a commercial company continue to work through the final stages of negotiating a licence agreement for the technology (next stage due Feb 2008).</p>
December 2005	Bloodless skin wrinkle removal technology full scale trials	Trials conducted	<p>A further two series of trials have commenced to address</p> <ol style="list-style-type: none"> 1. Developments in Application Technique (6 trial sites) and 2. Development of a Universal Clip design (5 trial sites) which is expected to replace the breech and tail clip designs and thus simplify the application of clips. Observations to date indicate the tail clip may need a slight modification while the universal clip appears to be working well. <p>It is also envisaged that trials will be needed to prove biodegradability of various plastic or other compounds to prove they have similar properties to current clips</p>

Date	Milestone	Measure of Success	Progress against Milestones
December 2005	Scoring system and guidelines for breeding sheep with low breech flystrike susceptibility released	Scoring system launched and widely available	<p>Complete</p> <p>A Sheep Visual Scores booklet – Industry version - contains scoring criteria for wool quality and conformation traits has been revised to ensure illustrations and descriptions address industry feedback. A media launch for the newly published guide was undertaken in November 2007 and the guide has been distributed to producers. A more detailed version of the guide has been produced for researchers and is currently being distributed for use in research flocks.</p>
June 2006	Bloodless skin wrinkle removal technology in commercial use	Commercial availability and industry take-up	<p>The potential commercial partner has maintained close contact with the progress of the field trials on the nearly 44 000 lambs on 200 properties and has attended two of the initial training activities and several trial sites.</p>
June 2006	Preliminary field trials of intradermal treatment and prototype applicator(s) completed	Publication of report detailing results from treatment of up to 1000 lambs	<p>Trial terminated due to results to date being inconclusive and due to flaws in trial design a decision has been made to terminate this trial after the 18 month measurements. Eighteen month results currently being collated for analysis.</p>
June 2006	Commercial partner identified, registration trials commenced	Agreement signed with commercial partner, written confirmation from AWI that trials have commenced	<p>Cetrimide based intradermal has failed the welfare assessment and research/development work on this product has ceased. AWI is continuing to work with a private company developing its own intradermal.</p>
December 2006	Detailed studies of pain relief options completed and, if any are feasible, agreement signed with commercial partner to launch the product onto the sheep market	Publication of report; agreement signed with commercial partner	<p>AWI has completed two detailed studies and the national science agency CSIRO has completed a further study, which has been published in the Australian Veterinary Journal. Reasonable interest in the results has been shown by at least one product registrant but feasibility has not yet been established. AWI has begun discussions with product registrants to encourage registration of an NSAID for sheep. A post-mulesing spray for the relief of pain has been released on a limited registration basis by the private company Animal Ethics Pty Ltd, has been licensed to Bayer and is being used by some producers and contractors post conventional mulesing.</p>

Date	Milestone	Measure of Success	Progress against Milestones
December 2006	Mulesing accreditation completed	Register and accreditation completed	Accreditation of contractors is essentially complete. The NMAP program accredited 378 people for the calendar year 2007 bringing the total number of accredited persons to 1078 at the end of 2007. An additional 541 operators have completed stage 1 Theory during 2007. Of the 2,000 manuals in the initial print run, 1,800 have been distributed to contractors and owner operators. A further print run of 1,800 has been purchased, which should meet requirements through calendar year 2008.
March 2007	Effective analgesia for mulesing	Registered product on the market	See above
June 2007	Cetrimide based registration dossier completed and lodged with Australian Pesticides and Veterinary Medicines Authority	Written confirmation of receipt of dossier from APVMA	See above. Research on Cetrimide based intradermal halted due to failure of product in welfare assessment
December 2007	First lambs born to specially selected ewes in breeding trial, preliminary comparisons available	Publication and extension to sheep breeders of preliminary comparisons	2006 drop lambs bred in the project have been assessed for a number of breech strike resistance indicator traits. Production data (wool cut, micron, body weight) will be collected in final quarter of 2007 and analysis conducted to determine relationships between breech indicator traits and production traits. Level of breech strike was similar for the mulesed control animals and the un-mulesed selected animals but was significantly higher for un-mulesed control animals. Detailed reports have been published in the Nov/Dec newsletters from each site
June 2008	At least one alternative to mulesing is launched to limited market (controlled commercial use while impacts fully evaluated)	Product is available on a limited commercial basis	Nearly 44 000 lambs on 200 properties across all wool producing areas of Australia have been treated with clips. Follow up observation data has been collected and is being processed – final report due in May 2008. Commercialisation is proceeding with increasing direct involvement of the commercial partner in the planning process for 2008
June 2009	At least one alternative to mulesing launched	Product is available on an unlimited commercial basis	
June 2009	Project to test 'no-mules' husbandry alternative husbandry systems completed	Alternative husbandry systems for some wool production systems / geographic areas identified and extended	AWI produced a flystrike and management training CD "Fighting Flystrike" which was mailed to 27 000 sheep and wool producers in Feb 2008. This is a practical guide for Australian wool producers designed to (a) improve their understanding of factors leading to flystrike and (b) help them implement plans to prevent flystrike.

Date	Milestone	Measure of Success	Progress against Milestones
December 2009	Detailed results from breeding trial available (first drop of lambs 2 years of age)	Publication and extension to sheep breeders of detailed comparisons	

Appendix "B" - Completed Milestones

Date	Milestone	Measure of Success	Progress against Milestones
December 2005	At least two proof-of-concept applicators ready for field trials of collagenase	Applicators demonstrated	Complete Applicators: Three proof-of-concept applicators were trialled in November 2005. One has been particularly successful and is the applicator of choice. We have shelved one of the other applicators and development of the third is on hold as it is no longer considered to be a viable alternative to the lead injector. (Note: collagenase is no longer a lead active – we have at least two replacements.)
December 2005	Complete feasibility trials on a range of pain relief agents	Publication of list of pain relief agents for detailed study	Complete Pain relief agents: two experiments have now been conducted, the first with two agents at various doses, the second with six agents. The second trial has highlighted two agents with potential and discussions are underway with three registrants to gauge interest in obtaining sheep registration for their products.
March 2006	Alternatives to collagenase developed	Commencement of commercialisation	Complete Trials are continuing on intradermal treatments (alternatives to collagenase). The trials are addressing efficacy, pattern of application, formulation and welfare impacts. Potential commercial company finalising due diligence on the technology. A trial has been run in conjunction with the company assessing the lead formulations, pattern and application method.
June 2006	Formulation of intradermal treatment complete	Details of formulation held by AWI	Complete Report on final trial of two most promising formulations received.
June 2007	Applicator(s) fully transferred to manufacture and available on the market	Confirmation from commercial partner that applicator is ready for large-scale manufacture	Complete MIT (Canada) applicator already available on request wholesale.