

29 April 2022

Ms Bridget Peachey
Program Manager Sheep Health and Welfare,
Australian Wool Innovation Limited
Level 6, 68 Harrington St.
The Rocks
Sydney NSW 2001

Dear Bridget,

RE: AVA REPORT ON PROGRESS OF AWI RD&E FLYSTRIKE PREVENTION PROGRAM

On 19th April 2022 AVA appointed auditors Dr Graham Lean and Professor Bruce Allworth, joined you and Geoff Lindon as representatives of Australian Wool Innovation Limited (AWI) to conduct a review of progress of AWI's Flystrike Prevention program against Research, Development and Extension milestones.

The report detailing the AVA appointed auditors findings is attached.

If you require further details or clarification of any points raised, please do not hesitate to contact me.

Yours sincerely,



Dr Warwick Vale
National President

Cc	Mr John Roberts CEO Australian Wool Innovation Level 6, 68 Harrington St The Rocks SYDNEY NSW 2001	
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**REPORT BY AVA APPOINTED AUDITORS AFTER REVIEWING THE PROGRESS OF AUSTRALIAN WOOL INNOVATION'S
FLYSTRIKE PREVENTION RESEARCH, DEVELOPMENT, EDUCATION, EXTENSION and COMMUNICATION (RDEEC)
PROGRAM AGAINST THEIR OBJECTIVES.**

April 2022

Scope of Review:

This review is intended to provide an independent assessment and review of the progress that Australian Wool Innovation (AWI) has made in its Flystrike RDEEC program against the published milestones and objectives since the last report in April 2021. The report is primarily aimed at informing wool growers and overseas retailers utilising Australian wool of progress and developments in the area of Flystrike prevention, and is a consequence of an undertaking in 2005 to overseas manufacturers and retailers of clothing incorporating Australian wool by the Australian wool industry.

Approach:

A review of the AWI research program was held between independent auditors appointed by the Australian Veterinary Association (Dr Graham Lean and Professor Bruce Allworth) and AWI (Ms Bridget Peachey and Mr Geoff Lindon) by meeting on 19^h April 2022 at AWI offices (Sydney). Written reports from AWI together with relevant verbal reports were provided across a range of areas.

Findings:

AWI continues to invest in research aimed at decreasing breech strike and specifically to decrease the reliance of wool producers on mulesing. The planned AWI Sheep Health and Welfare program budget for 2021-22 was \$A1.5 m of which 80% is directed at activities to better manage flystrike. It should also be noted that while the original thrust of the AWI flystrike research program was aimed at managing breech strike only, a number of current research programs are now aimed at managing fly strike in general. Over the past year, AWI managed a total of 14 projects, including 2 projects that commenced and 2 projects completed during the reporting period. This work, while still focused on finding alternatives to mulesing, continues to support much broader sheep welfare outcomes. In this reporting period there is continuing emphasis specifically on vaccine development, and a strong focus on extension of control methodologies. A number of the projects have resulted in the production of papers for publication in scientific journals and extension articles for sheep producers.

Non-Invasive Management Practices (5 projects - 2 completed, 3 ongoing) is an important area of current research activity, with emphasis on developing an effective vaccine against flystrike (3 projects).

Breeding and selection (1 project) research work is now focussing on acquiring and utilising genomic data, with the commencement of a project to gather data from the Merino Lifetime Project dataset and the planning of a second project to establish the ability to collect genomic data from other flocks.

Breech Modification Procedures projects are not currently being funded by AWI.

Analgesia and Anaesthesia remains a focus for the Program but there are currently no research projects being undertaken.

Education, Extension and Promotion (8 projects – 2 completed, 2 ongoing, 2 commenced) continues to focus on the support of the successful ParaBoss website and extension activities with advisors and producer groups. A series of Workshops and webinars are either being held or designed to support producer decision-making in the managing of flystrike, including moving to a non-mulesed system. Three webinars for one of these initiatives (It's Fly Time) was attended by 900 producers. AWI continues to support the Sheep Sustainability Framework, and its first Report is due in July 2022. This provides some objective data on level of mulesing, availability of non-mulesed wool, and adoption of pain relief.

A description of current projects and some commentary is provided below.

Table 1. Progress for AWI's Flystrike Prevention Program, Apr 2022

	<i>Current Projects</i>	<i>Current work / Progress</i>	<i>Comments</i>
Breeding and selection (1 project)	Genomics of Flystrike	Commenced. Extension of previous genetics outcomes incorporated	Use of genomic data to better identify flystrike resistant genotypes
Non-invasive Management Practices (5 projects)	Vaccine development (3) Nanotechnology Chemical Resistance management modelling	Vaccine projects ongoing. Nanotechnology and modelling projects completed.	Work focusing on vaccine development to prevent flystrike. Promising early work, now focussing on getting an effective commercial vaccine.
Analgesia and Anaesthesia	No current projects		Remains a high priority.
Breech Modification Alternatives		Best practice lamb marking manual and Extension work (eg Stratefly, SimpliFly) -see below.	No current AWI funded work.
Education, Extension and Promotion (8 projects)	Producer/advisor webinars /workshops/ publications (4) Lamb marking online course ParaBoss support Animal Welfare Forum Sheep Sustainability Framework support	3 webinars with 900 participants (It's FlyTime); development of SimpliFly, ClassiFly, StrateFly and AmpliFly for late 2022/23 delivery.	On-going commitment for research outcomes to be applied on-farm.

AWI FLYSTRIKE RESEARCH, DEVELOPMENT, EDUCATION, EXTENSION AND COMMUNICATION STRATEGY AUDIT FORM

DATE: 19 April 2022

NON-INVASIVE MANAGEMENT PRACTICES

THE AIM: Improved management practices to reduce the risk of flystrike

Stated Outcome	Status during Reporting Period - 5 projects	Comment – 2 completed, 3 ongoing	Outcome Achieved
Monitor and define blowfly resistance to chemicals.	Work completed previously. No current activity.	Publication in IJP: Drugs and Drug Resistance (2020). Commercial activity available.	Yes
Refine blowfly chemical resistance best practice management advice.	00651 -Honours modelling project -completed -Final Report available Further work planned	Summer shearing, crutching increased resistance, winter shearing not cost-effective. FlyBoss updated.	Yes
Invest in early trials of new potential actives and parasitic control treatments and vaccines.	00549 - nanotechnology- completed-Final Report available 00619 - vaccine – ongoing-final report due end 2022 00801 – vaccine – new project to fast track vaccine development	Commercial application of nanotechnology being discussed. 50 prototype vaccines tested in 45 flocks. New project to get to commercialisation faster -narrow 50 to 2 candidates.	Yes
Complete a population study of blowflies to identify potential genetic differences to inform blowfly management programs.	00624 – Informing on vaccines- ongoing - final report due mid 2022	Important work to understand potential for differing fly populations - Tas, Qld and WA different to others	Yes

ANALGESIA AND ANAESTHESIA

THE AIM: Improved provision of analgesia and anaesthesia for surgical husbandry practices.

Stated Outcome	Activity during Reporting Period – No current projects	Comment	Outcome Achieved
Investigate longer acting, cost effective anaesthesia and analgesia options.	00550- Gap Evaluation- completed previously. Open access publication. No current activity.	Small, A.; Fisher, A.D.; Lee, C.; Colditz, I. Analgesia for Sheep in Commercial Production: Where to Next? <i>Animals</i> 2021, 11, 1127. https://doi.org/10.3390/ani11041127	YES
Extend advice on analgesia and anaesthesia to woolgrowers.	Updated Anaesthetics and Analgesics Factsheet	https://www.wool.com/globalassets/wool/sheep/research-publications/welfare/breeding/btb_march2021_p34-35.pdf	YES

BREEDING AND SELECTION

THE AIM: Long term solutions to advance lifetime welfare.

Stated Outcome	Activity during Reporting Period– 1 Project	Comment– 1 commenced, 1 in planning stage	Outcome Achieved
Understand the performance and economic impacts of breeding for reduced flystrike.	Work completed previously. No current activity.	Beyond the Bale article Dec 2021	YES
Investigate the, as yet unknown, factors that cause flystrike.	Work completed previously. No current activity.		YES
Improve the accuracy of selection for flystrike resistance traits through phenotyping and genotyping.	00775- AGBU MLP- genomics of flystrike – Commenced 00820 – flystrike genomic flock- planning stage	Focus on acquiring and using genomic data.	YES

Better understand how to reduce the incidence of dags and urine stain through breeding.	Work completed previously. No current activity.	Greeff,J; Karlsson, L; Schlink,A. Are breechstrike, dags and breech wrinkle genetically the same trait in crutched, uncrutched and mulesed Merino sheep? Animal Production Science, 2019, 59, 1777–1782 https://doi.org/10.1071/AN18461	YES
Track genetic trends for breech wrinkle, breech cover, dags and higher productivity	00775 also has application in this area	Beyond the Bale article	YES

BREECH MODIFICATION PROCEDURES

THE AIM: Breech modification procedures to improve lifetime resistance to flystrike.

Stated Outcome	Activity during Reporting Period - 0 Projects	Comment	Outcome Achieved
Undertake further R&D of the animal welfare impacts of breech modification procedures.	No activity		
Undertake further R&D to refine the application protocols for breech modification procedures.	No activity		
Support best practice mulesing training.		Lamb marking manual on-line training course (see below) Extension activities aimed at best practice / non-mulesing initiated (eg SimpliFly, StrateFly)- see below	YES

EDUCATION, EXTENSION AND PROMOTION

THE AIM: Adoption of best practice strategies to improve the lifetime welfare of sheep, reduce reliance on mulesing and support transparency in the supply chain.

Stated Outcome	Activity during Reporting Period – 8 Projects	Comment- 7 ongoing, 1 commenced	Outcome Achieved
Develop and implement education, training and extension strategies to improve lifetime welfare of sheep.	00790-ParaBoss III-commenced (with MLA) 00651 Lamb Marking Online Course- development		YES
Monitor, evaluate and improve the success of education, training and extension strategies.	Within projects below		
Engage with woolgrower advisors on the RD&E program.	00651 Blowfly Chemical Resistance (DemystiFly)- publication 00765 Flystrike Extension Package (It's Fly Time! and SimpliFly) – webinar/workshop 00815 Breeding for Flystrike Resistance Workshops (ClassiFly) 00818 Moving to a Non-Mulesed Enterprise (StrateFly and AmpliFly)	Three It's Fly Time events held (900 participants) Other "Flies" due late 2022/2023 AmpliFly aimed at advisors.	YES
Ongoing engagement with domestic and international stakeholders to ensure they understand best practice management of flystrike and the welfare implications.	00816 - Sheep Sustainability Framework 00651 Welfare forum held 19 April 2022	SSF launched April 2021, first report due July 2022	YES