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Ron Kirk
United States Trade Representative
600 17th St. N.W.
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**Via electronic submission**

RE: UNITED STATES—TRANS-PACIFIC PARTNERSHIP TRADE AGREEMENT
DOCKET: USTR-2009-0041

Dear Ambassador Kirk:

People for the Ethical Treatment of Animals (PETA) appreciates the opportunity to submit comments to the United States Trade Representative in response to Docket No. USTR-2009-0041 regarding the proposed Trans-Pacific Partnership Trade Agreement (TPP) with Australia, Brunei Darussalam, Chile, New Zealand, Peru, Singapore, and Vietnam, as announced in the *Federal Register*, Vol. 74, No. 240, on December 16, 2009, pages 66720-2.

## Background

PETA is the world's largest animal rights organization, with more than 2 million members and supporters. We are concerned about the United States entering into additional trade agreements with Australia without addressing the fact that the Australian wool industry has reneged on its promises and agreements to phase out the hideous mulesing mutilation by 2010. Australia is home to the world's largest population of merino sheep, producing more than 50 percent of the world's merino wool supply (Australian Bureau of Statistics 2003). Any wool labeled "merino" has thus quite likely come from Australian sheep, who suffer immeasurably both during and after the wool-production process. Scientific publications, investigative footage, and news reports from Australia reveal the horrors of the mulesing mutilation.

## The Mulesing Mutilation

Mulesing is practiced primarily on merino lambs and involves the stripping away of large areas of skin and flesh from sheep's hindquarters so as to prevent the growth of wool. It is performed as a preventive measure against a painful condition called "flystrike," which occurs when the eggs of blowflies laid in woolly areas of sheep's skin hatch into maggots, leading to infestation and eventual death by ammonia poisoning. Blowflies are especially prone to laying their eggs in the breech area of merino sheep because the many folds of skin that characterize this breed tend to accumulate moisture, feces, and urine, especially when covered with wool. Mulesing is highly abusive, causing both acute and

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chronic pain, and it is unjustifiable, especially given the availability of more humane flystrike-prevention alternatives.

During mulesing, lambs are thrown onto their backs and their legs are restrained while the skin and wool around their backsides is carved away with metal shears to expose the flesh. At the same time, their tails are often cut off. The procedure is tantamount to partially skinning the animals alive without anesthetics. The resulting bloody wounds have been found to remain unhealed for 22 to 30 days (Fell and Shutt 1989, Chapman *et al*. 1994). It has been estimated that approximately 60 to 80 percent of merino sheep are subjected to mulesing in Australia (Beck *et al*. 1985 in Counsell 2001, Morley and Johnstone 1983 in Fell and Shutt 1989, Baillie 1979 in Townend 1985, Australian Senate Select Committee on Animal Welfare 1989 in Pope 1997), statistics that suggest that at any given time, there are approximately 82 million mulesed sheep in Australia.

**Physical Indicators of Stress From Mulesing**

In its code of sheep-welfare recommendations, the New Zealand Ministry of Agriculture and Forestry writes that mulesing "causes pain both at the time it is carried out and during the healing process" (MAF 1996, §7.1.3). Much scientific evidence shows that physiological and behavioral indicators of stress in mulesed sheep are very high, proving that mulesing is indeed extremely painful. In physiological terms, the degree of stress is usually determined by measuring plasma cortisol concentrations—"the most commonly used physiological indicator of stress," according to Chapman *et al*. (1994 p 243)—and ß-endorphin levels, both of which are known to rise during times of stress.

Fell and Shutt (1988) measured both salivary and plasma cortisol concentrations in a study of 63 merino crossbred lambs and found that mulesing was the greatest acute stressor of all the procedures to which sheep are typically subjected on farms, including castration, docking, rough transport, pizzle dropping, tooth-grinding, and shearing.

Chapman *et al*. (1994) discovered that, following mulesing, plasma cortisol concentrations "increased immediately and rapidly" and remained elevated for at least 48 hours (p 243). Shutt *et al*. (1987) studied 50 merino crossbred lambs and found that mulesing and tail-docking could multiply mean plasma ß-endorphin concentrations by 10. Fell and Shutt (1989) tested mulesed merino wethers between five and 15 minutes following mutilation and found signs of suffering in the form of "[m]arked elevation of plasma cortisol and ß-endorphin" (p 283). The stress associated with mulesing is so great that Jongman *et al*. (2000) found the EEG patterns of animals being mulesed to be similar to those of animals who had been given injections of formalin in the hoof to cause "acute pain and subsequent inflammation, lameness, and associated chronic pain" (p 340).

**Behavioral Indicators of Stress From Mulesing**

In their comprehensive, long-term study, Fell and Shutt (1989) found that stress-related behavior in sheep continued for up to 113 days following mulesing. Among other examples, mulesed sheep displayed abnormal postures—most likely resulting from the painful mulesing wound—for up to 48 hours following mutilation; "they stood with head down, nose almost touching the ground, back arched, and body hunched" (p 288). Chapman *et al*. (1994) verified these findings in their own study, reporting that "surgically mulesed sheep quickly assumed a hunched-up posture" (p 246).

Normal daily behavior was also altered for up to 72 hours. As compared to sheep in the control group, mulesed sheep did not engage in routine feeding, lying, or grazing. Instead, they spent much of their time standing idle, unable to engage in normal activities because of the severe trauma that they had experienced. Researchers did not observe any of the mulesed animals lying or resting on the day following mutilation or even drinking until the second day following mutilation. Chapman *et al*. (1994) further found that mulesed sheep lost weight during the week following mutilation, "moved about less frequently and over shorter distances than the [control-group sheep] during the first eight days after treatment," and often simply stood still (pp 244-5).

**Psychological Indicators of Stress From Mulesing**

It has been shown that sheep are highly intelligent and able to recognize human faces (Boivin *et al*. 1997). Kendrick *et al*. (2001) found that sheep can even form mental images of humans and remember—and distinguish among—50 different sheep's faces for more than two years, even if they haven't seen any of the faces during that time. This ability was discovered by means of a test wherein sheep were shown 25 pairs of similar sheep faces—some of them in profile—and taught to associate certain faces with a food reward. When presented with the pairs of faces and the potential for earning the reward, the sheep consistently identified the correct faces. Analysis of their brain activity during these exercises indicates that sheep use the very same areas of the brain for visual recognition as humans do: "Sheep … possess similar specialized neural systems in the temporal and frontal lobes for assisting in this important social task, including a greater involvement of the right brain hemisphere" (pp 165-66). The researchers who conducted the test reportedly concluded that sheep may be capable of emotion and conscious thought (Briggs 2001).

Such studies help explain the long-term emotional stress and psychological aversion that sheep experience and display in the presence of handlers who perform mulesing. Fell and Shutt (1989) conducted an "arena test" in which mulesed sheep were placed in the same pen with the handler who had performed the procedure on them. Aversion behavior was measured in intervals and, while found to be most intense for the first 37 days, continued to be noted for up to 113 days. While "control animals turned and moved toward the handler … mulesed animals turned and moved in the opposite direction in 95% of all tests up to Day 37" (p 288). The pain of mulesing is so intense that it leaves a lasting impression. Chapman *et al*. (1994) observed similar aversion during a 30-day post-mulesing arena test and concluded that the sheep's aversion to their handler may be "a conditioned response to the association of immediate pain [from mulesing] with … human handling" (p 246).

**Pathology Caused by Mulesing**

Mulesing can also cause suffering by actually facilitating flystrike in areas of blowfly activity—the very condition it is supposed to prevent. The Agriculture and Resource Management Council of Australia and New Zealand's Animal Health Committee (ARMCANZ 1991) acknowledges this problem when addressing the best management practices for sheep and states, "After mulesing, lambs should be observed from a distance … for signs of fly strike of the wound" (p 12). The New Zealand Ministry of Agriculture and Forestry also writes that "there is a risk of infection and flystrike of the mulesing wound itself" (MAF 1996, §7.1.3). Cook and Steiner (1990) found that under conditions where blowflies were present, egg masses were deposited into 93 percent of untreated wounds within 48 hours and into 85 percent of all wounds, even those dressed with a blowfly-repellent treatment, by the ninth day. They remarked that "[t]he overriding finding of this trial has been that mulesing wounds are highly susceptible to strike by [*Lucilia cuprina*, the blowfly responsible for flystrike in Australia] one week after mulesing, irrespective of whether the wound ha[s] been chemically treated immediately after mulesing or left untreated" (p 354). In another study, researchers from the Western Australian Department of Agriculture (Harrington and Steiner 1993) found that after mulesing, "95% of untreated lambs were attractive to oviposition by *Lucilia cuprina* … and 90% subsequently developed flystrike within 4 [days] of mulesing" (p 190). One-third of treated lambs were afflicted as well. The authors conclude that "fresh mulesing wounds can be attractive to *L. cuprina* and susceptible to strike" (p 191).

In its periodical *Surveillance*, the New Zealand Ministry of Agriculture and Forestry (MAF 2002) reports that mulesing is believed to transmit a potentially deadly disease called eperythrozoonosis, which can lead to recurrent anemia, bloody urine, and listlessness. Eperythrozoonosis infections recur during times of stress (Kabay 1997) and are caused by microscopic blood parasites that may easily be spread in the bloody conditions that mulesing creates.

## More Humane Alternatives to Mulesing

Many humane, effective, and cost-efficient alternatives to mulesing are available, as has been discovered not only by Australian farmers who do not employ the procedure—a group that is estimated to include as many as 40 percent of producers (Beck *et al*. 1985 in Counsell 2001)—but also by all sheep farmers in the U.K. (the world's fifth-largest supplier of greasy wool), where mulesing is generally prohibited in favor of alternative flystrike-prevention methods. Moreover, unlike mulesing, which only addresses breech strikes, most of the alternatives described below help prevent all forms of flystrike, including strikes on the breech, body, and face.

### Selection for Less Susceptible Breeds

Experts regard genetic selection of sheep who are resistant to flystrike as the most effective long-term solution. Tellam and Bowles (1996) cite a study in which only 8 percent of 1-year-old resistant sheep suffered from fleece-rot (a condition that predisposes sheep to flystrike), as compared to 53 percent of susceptible sheep. Also, the incidences of body strike in the resistant and the susceptible groups was 1 percent and 19 percent, respectively. Selection of merinos with smoother skin would not only reduce flystrike but also improve wool quality. Scobie of AgResearch (2004) observes that "[w]ool quality tends to suffer on wrinkly sheep" and, citing the findings of other scientists, further reports, "Australian research has shown that mulesed wrinkly sheep were just as likely to be flystruck as plain-bodied sheep that were not mulesed." Scobie *et al*. (2002) found that sheep with naturally occurring areas of bare skin on their breech were significantly less likely to develop flystrike. In these experimenters' study, lambs with the greatest breech bareness were not flystruck, whereas 22 percent of those with the least breech bareness were—statistics that suggest that breeding for breech bareness can be an effective flystrike-prevention tool.

## Increased Monitoring and Treatment

Perhaps the most effective option is simply to increase monitoring for early signs of flystrike and to provide treatment when necessary. Evidence gathered through communication with organic producers suggests that "fly strike is largely preventable if farmers keep sheep healthy and inspect them regularly" (Morris 2000 p 205). Dr. John Auty, a veterinarian who formerly worked with the Australian Department of Primary Industry as the assistant director of the Bureau of Animal Health, has been quoted as saying, "Mulesing does not free the sheep from blowfly strike, but proper husbandry practices, including close inspection of sheep, will reduce and virtually eliminate flystrike." Early-warning computer-simulation models can help predict times of increased blowfly activity (Tellam and Bowles 1996) and may be useful for warning producers to increase monitoring efforts.

## Insecticides

A study of flystrike-control methods in the U.K. found that "at present, the control of blowfly strike is most commonly achieved through the application of insecticide or other larvicide, either used prophylactically or, more commonly, in response to perceived seasonal patterns of high strike challenge" (Fenton *et al*. 1998 p 342). Tellam and Bowles (1996) write that "[o]ne of the mainstays of the wool industry for control of blowfly strike is the use of insecticides" that can be "used in dressings applied to flystruck areas on sheep" (p 263).

## Vaccinations

Bowles *et al*. (1996) were able to "successfully vaccinate sheep against larvae of the sheep blowfly" and concluded that "protection from flystrike through vaccination using native larval antigens can be achieved" (pp 1347, 1351). Tellam and Bowles (1996) report data from several trials that reveal that nonvaccinated sheep were more than twice as likely to develop blowfly-infected sites as vaccinated sheep, more than half of whom were completely protected from infections (as determined by "a failure of the larvae to establish a wound on vaccinated sheep"), as compared to none of the nonvaccinated sheep (p 267).

## Topical Applications

Painless topical applications for preventing wool growth are currently being developed. Researchers at the University of Adelaide, funded by Australian Wool Innovation (AWI 2003), recently discovered a protein that, when applied to sheep's skin, causes follicles to die and seems to cause no ill effects for the sheep. When applied to sheep's breech area, this protein would create large areas of bare skin, producing the same effect as mulesing but without inflicting painful wounds.

## Sterile Male Blowfly Release

As female blowflies only mate once during their lifetime, the release of sterile male blowflies can help significantly reduce populations. Tellam and Bowles (1996) note that "[t]he suppression of fly numbers is usually accentuated by further releases of sterile male insects until the natural population is no longer sustainable" (p 268).

**Baited Traps**
Dymock and Forgie (1995) used a non-insecticidal blowfly trap in an area where all four flystrike species were present and, during the first year of observation, found that only four of 600 unmulesed sheep were struck. Those four cases represent a strike rate of 0.0067 percent, which compares favorably to the strike rate of 2 percent per year that was found in another study in New South Wales, where mulesing is prevalent (Wardhaugh and Morton 1990 in Morris 2000). Other researchers have found that the use of bait traps, both synthetic and organic, are effective in controlling blowfly populations (Smite and Wall 1998, Fisher *et al*. 1998). Another advantage to trapping is that the volume of flies in the traps themselves can serve as an early warning signal for producers to increase flystrike monitoring and treatment efforts.

**Improved Farm-Management Practices**
French *et al*. (1994) surveyed 2,451 sheep farmers and found that "[t]he risk of a farm['s] reporting at least one case of blowfly strike increased as flock size and stocking density increased" (p 51). Furthermore, there was no significant positive association between the practice of tail-docking and reduced incidence of flystrike. These findings suggest that farmers who reduce stocking densities will lessen their sheep's risk of flystrike and that tail-docking offers no such benefit. Leathwick and Heath (2001) found that diet could also play a role in flystrike prevalence and that lambs who grazed on forage consisting of birdsfoot trefoil were less likely to suffer from flystrike than lambs who grazed on ryegrass and white clover. Producers can effectively control flystrike even further by rearing sheep in cool, dry regions where blowfly populations are less likely to flourish. And Tellam and Bowles (1996) explain that shearing and crutching ("the removal of dags and urine-stained wool from around the breech area"), especially when synchronized with the worst periods of fly activity, decrease "the likelihood of fly strike" by "reducing the attractiveness of this region to the gravid female blowfly" (pp 262-63).

## Banning Mulesing Is the Only Humane Option
Mulesing is only one of many flystrike-control methods available. As the scientific literature proves, it causes animals harm and can sometimes leave them vulnerable to flystrike by inflicting wounds. Mulesing is an abusive practice that causes acute, chronic pain and should be abolished as a form of cruelty to animals—especially in light of the fact that other effective and more humane flystrike-prevention methods are available. This conclusion was foreshadowed in 1989 by the Australian Senate Select Committee on Animal Welfare when it observed that "in areas of higher sheep density and smaller flocks, there was evidence that some producers were able and willing to put in the extra time and effort to breed out faults in sheep, to select resistant sheep, to control worms, [and] to inspect and crutch and jet with chemicals more frequently to ensure a healthy flock without recourse to mulesing" (qtd in Pope 1997 p 10).

Submitted by:

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### ***References***


[ARMCANZ] Agriculture and Resource Management Council of Australia and New Zealand. 1991. Model Code of Practice for the Welfare of Animals: The Sheep. East Melbourne: CSIRO Publications. 17 p.

Australian Bureau of Statistics. 2003. The wool industry—looking back and forward. Available from: www.abs.gov.au/ausstats.

Australian Senate Select Committee on Animal Welfare. 1989. Sheep Husbandry. Canberra: Australian Government Publishing Service.

The Australian Sheep and Wool Industries on the Web. 2003. Sheep breeds found in Australia. Available from: www.aussiesheep.com/sheep.htm.

[AWI] Australian Wool Innovation. 2003 Jan. Seeking the painless mulesing alternative. Beyond the Bale 1(3). Available from: www.wool.com.au.

Baillie BG. 1979 Jun. Management practices for controlling flystrike. National Symposium on the Sheep Blowfly and Flystrike in Sheep; Sydney, Australia.

Boivin X, Nowak R, Despres G, Tournadre H, Le Neindre P. 1997. Discrimination between shepherds by lambs reared under artificial conditions. J Anim Sci 75:2892-8.

Bowles VM, Meeusen ENT, Young AR, Andrews AE, Nash AD, Brandon MR. 1996. Vaccination of sheep against larvae of the sheep blowfly (*Lucilia cuprina*). Vaccine 14:1347.

Briggs H. 2001 Nov 7. Amazing powers of sheep. BBC News. Available from: http://news.bbc.co.uk/1/hi/sci/tech/161463.stm#sheep.

Chapman RE, Fell LR, Shutt DA. 1994. A comparison of stress in surgically and non-surgically mulesed sheep. Aust Vet J 71:249-7.

Cook DF, Steiner EC. 1990. Susceptibility of mulesing wounds to oviposition and strike development by the Australian sheep blowfly *Lucilia cuprina*. Aust Vet J 67:352-5.

Counsell D. 2001. A benefit-cost analysis of the mules operation to the Australian sheep flock. Proceedings of the FLICS Conference; Launceston, Tasmania, Australia.

Dymock JJ, Forgie SA. 1995. Large-scale trapping of sheep blowflies in the northern North Island of New Zealand using insecticide-free traps. Aust J Exp Agr 35:699-704.

[FAO] Food and Agriculture Organization of the United Nations. 2002. Major Food and Agricultural Commodities and Producers. Available from: www.fao.org/es/ess/top/commodity-jsp?commodity=987&lang=EN&year=2002.

Fell LR, Shutt DA. 1988. Salivary cortisol and behavioural indicators of stress in sheep. Proc Aust Soc Anim Prod 17:186-9.

Fell LR, Shutt DA. 1989. Behavioural and hormonal responses to acute surgical stress in sheep. Appl Anim Behav Sci 22:283-94.

Fenton A, Wall R, French NP. 1998. The effect of farm management strategies on the incidence of sheep strike in Britain: a simulation analysis. Vet Parasitol 79:341-57.

Fisher P, Wall R, Ashworth JR. 1998. Attraction of the sheep blowfly, *Lucilia sericata* (*Diptera: Calliphoridae*) to carrion bait in the field. B Entomol Res 88:611-6.

French N, Wall R, Cripps PJ, Morgan KL. 1994. Blowfly strike in England and Wales: The relationship between prevalence and farm and management factors. Med Vet Entomol 8:51-6.

Harrington SA, Steiner EC. 1993. Susceptibility of freshly-mulesed lambs to flystrike and the effectiveness of propetamphos as a wound dressing. Aust Vet J 70:190-1.

Jongman EC, Morris JP, Barnett JL, Hemsworth PH. 2000. EEG changes in 4-week-old lambs in response to castration, tail docking, and mulesing. Aust Vet J 78:339-43.

Kendrick KM, Da Costa AP, Leigh AE, Hinton MR, Peirce JW. 2001. Sheep don't forget a face. Nature 414:165-6.

Leathwick DM, Heath ACG. 2001. Specialist forages—A role in flystrike management? Proceedings of the FLICS Conference; Launceston, Tasmania, Australia.

[MAF] New Zealand Ministry of Agriculture and Forestry. 1996 Jul. Code of recommendations and minimum standards for the welfare of sheep. Code of Animal Welfare No. 3 (Revised).

[MAF] New Zealand Ministry of Agriculture and Forestry. 2002. Quarterly review of diagnostic cases. Surveillance 29(2):28.

Morley FHW, Johnstone IL. 1983. Mules operation—a review of development and adoption. In: Raadsma HW (Ed.). Sheep Blowfly and Flystrike in Sheep. Department of Agriculture NSW, Proc. 2nd Natl. Symp.; Sydney. pp 3-24.

Morris M. 2000. Ethical issues associated with sheep fly strike research, prevention, and control. J Agr Environ Ethic 13:205-17.

Pope S. 1997. Preventing flystrike: Alternatives to mulesing? Collingwood: Australian and New Zealand Federation of Animal Societies, Inc. 33 p.

Raadsma HW. 1987. Flystrike control: An overview of management and breeding options. Wool Tech Sheep Bree 35:174-86.

Scobie D. 2004. Wrinkles lower productivity. AgResearch. Available from: www.merino.co.nz/Wrinkles.htm

Scobie DR, O'Connell D, Bray AR, Cunningham P. 2002. Breech strike can be reduced by increased area of naturally bare skin around the perineum of lambs. Anim Prod Aust 24:201-4.

Shutt DA, Fell LR, Connell R, Bell AK, Wallace CA, Smith AI. 1987. Stress-induced changes in plasma concentrations of immunoreactive ß-endorphin and cortisol in response to routine surgical procedures in lambs. Aust J Biol Sci 40:97-103.

Smith KE, Wall R. 1998. Suppression of the blowfly *Lucilia sericata* using odour-baited triflumuron-impregnated targets. Med Vet Entomol 12:430-7.

Tellam RL, Bowles VM. 1996. Control of blowfly strike in sheep: Current strategies and future prospects. Int J Parasitol 27:261-73.

Townend C. 1985. Pulling the wool. Marrickville: Hale & Iremonger Pty Limited. 157 p.

Wardhaugh KG, Morton R. 1990. The incidence of flystrike in sheep in relation to weather conditions, sheep husbandry, and the abundance of the Australian sheep blowfly *Lucilia cuprina*. Aust J Agr Res 41:1155-67.