



TAUTUKU BLOCK X SECTION 3C TRUST

Chairperson: E.J.Palmer 47 Skibo St Kew Dunedin

SUPPLEMENTARY SUBMISSION TO THE ERMA 1080 HEARINGS PANEL REGARDING SWEETENERS/SUGAR IN VARIOUS 1080 FORMULATIONS

Some 24 hours prior to presenting my submission to the Authority's Hearings Panel I became aware that the "sweetener" mentioned in the Applicants' *Risk Assessment Section 3.2 Chemical and Physical Properties of the Substances* for items C, E, F and G was in fact imported sugar (sucrose). A definition of "sweetener" was not disclosed in either the Applicants' Risk Assessment or the Agency's Evaluation and Review report "Glossary of terms".

Unfortunately in the time available prior to the commencement of the Dunedin hearing I was unable to complete a comprehensive review of either the Applicants' consultation documents, Risk Analysis Assessment or the Agency's Evaluation report in respect of the use of "sweetener"/sugar in 1080 formulations being reviewed. However our verbal submission did ask the following question which was not answered at the completion of my submission to the Hearings Panel:

Mr Chairperson I would like to pose a question to the applicants what are the risks to beekeepers and native invertebrates and birdlife from 1080 pellets and pastes containing sugar and apple pastes given past experience?

BACKGROUND

As stated in our Trust's verbal submission, during the late 1980's early 1990's the beekeeping industry experienced a major problem with possum control operations using a raspberry jam based 1080 bait formulation killing beehives.

Attached to my verbal submission (enclosed) is an appendix A containing all of the information I still hold on the issue which is similar to that contained in the Parliamentary Commissioner for the Environment (1994) *Possum Management in New Zealand* report appendix D pages 180-1.

Sometime during the early/mid 1990's the use of the raspberry jam 1080 formulation was stopped/banned and a written bee warning placed on 1080 paste containers but I am not personally aware of the details.

The problem as I remember it was essentially bees were attracted to the sweetness/sugar in the raspberry jam which was apparently identical to that sold on supermarket shelves at the time. Apparently birds were also attracted to the raspberry seeds in the jam.

Potentially any product that contains sugar will attract nectar eating insects and birds including insectivorous birds especially during the harsher late winter early spring

months which happens to co-incide with the optimum time to undertake possum control.

Needless to say once I became aware of the sweetener/sugar issue the question arose as to why the Applicants' consultation document and Risk Analysis report had restricted the 1080 "adverse effects" discussion to bees/honey and ignored the risks to other nectar eating invertebrates and native birdlife.

The Applicants' Risk Analysis states at section 3.1 that the following 1080 formulations which contain sweetener/sugar are being reassessed:

<u>Item</u>	<u>Pesticide Registration No.</u>	<u>Sugar %</u>
C	V003785	3.9
C	V000825	18.75
C	V009015	4.0
C	V002829	4.0
E	V002848	4.0
E	V002538	42.2
E	V004811	30.0
F	V004812	30.0
G	V004918	30.0
G	V009174	10.0

From personal knowledge of using cyanide in possum fur recovery it is common practice for hunters to include anything up to 20% sugar into both prefeed and poison baits to make them more palatable to possums and mask the bitterness/odour of the cyanide. Likewise it was also common practice for sugar to be added to rabbit strychnine carrot/oat poisoning control programmes

Rather interestingly it would seem that no sugar is currently being used in possum and rabbit 1080 carrot/oat operations.

This raises the interesting question as to why significant volumes of sugar (estimated 100 - 150 tonnes pa) is being used in the manufacture 1080 cereal pellet and paste products?

APPLICANTS REPORTS

After an extensive review of the Applicants' documents I can only find the odd statement in relation to the use of sugar and the 1080 honey contamination issue:

- 1 Consultation document titled "*The Use of 1080 for Pest Control*" dated July 2004 page 27 states that;

Cereal based pellets are manufactured by compressing a mixture containing bran, kibbled grain and sugar along with 1080, green dye and flavouring such as cinnamon.

- 2 Applicants' Risk Analysis "register of adverse effect with 1080" (pages 245-6) states:

- Honey
The public may be exposed to 1080 contaminated honey via ingestion. 1080 is toxic to honey bees, however there is no research indicating the potential for sub-lethal exposure. Baits used in pest control are generally not attractive to bees (Broome et al. 2004), however this may not always be the case if bees are particularly hungry, and beekeepers should always be notified of operations. There have been recorded instances of bees being killed after feeding on 1080 paste baits, however the risk is very much reduced when alternative baits are used e.g., carrot, apple (Thomas et al., 2003).
- Controls
Specific controls in place to reduce exposure of honey bees are contained in the HSNO controls (see section 3.4). 1080 use is prohibited in an area where bees are foraging and the substance is in a form in which bees are likely to be exposed to it.....Honey bees were known to be attracted to 1080 paste baits used in pest control prior to 1995. Changes in formulation of 'Pestoff Professional' possum paste since then have been found to be unattractive to Bees (Morgan 2000).
- Potential Effects
There is no evidence to indicate that bees exposed to 1080 have contaminated honey supplies and no record of adverse effects resulting from human consumption of honey. In general the persistence of 1080 in food is short and is degraded into non-toxic metabolites. If humans ingest a sub-lethal dose, 1080 will be metabolized and excreted in urine in the same manner as in target pests (NZFSA, 2005).
- Risk Profile
1080 is not expected to cause human health effects via consumption of honey. The likelihood human exposure via ingestion is highly improbable (almost certainly not occurring but cannot be totally ruled out); the magnitude of effect is considered to be MINIMAL (no effects) and the overall risk is therefore assessed A (insignificant or minor and not warranting further assessment).

ERMA Agency Report mentions:

- 1 Table 4.4 (page 48) 1080 formulations states sugar is used in the manufacture of both pellets and pastes.
- 2 Appendix C Ecotoxicity and Environmental Fate of 1080 (page 352). C1.1 General –Hazard classification states:

The identity of the non-1080 components of the formulated baits is proprietary to the manufacturers. The Agency has reviewed the information available on the potential hazards of these components and concludes that they are all non-hazardous when assessed against the HSNO Act thresholds for ecotoxicity.

After much research I found the following statements in the 1994 Parliamentary Commissioner for the Environment's Possum Management report on page 69:

Although for many years 1080 was considered to be odourless and tasteless it is known that it has a slight odour and taste reminiscent of acetic acid (ie vinegar to which it chemically related) and that 1080 and/or its impurities can be detected by possums.

The PCE report on page 136 also contains a recommendation to the Pesticides Board to:

De-register 1080 paste baits that are attractive to bees. (Section 5.1.2 Appendix D)

Comments

1. Sugar is probably being added to cereal pellets to enhance the palatability of the cereal mix and also act as a binder and into paste as a sweetener.
2. A number of statements in Applicants' Risk Analysis report (pages 245-6) regarding honey/bees are incorrect and/or misleading.
3. During the consultation process the applicants failed to impartially disclose all material information so that Maori could make fully informed decisions in their role as kaitiaki.

RISKS TO INVERTEBRATES AND BIRDLIFE

Reading through the Agency's Evaluation report and attached "expert" appendices no attempt has been made to address the potential adverse risks of 1080 formulations containing significant volumes of sugar on nectar eating native birds and invertebrates other than bees.

I find this very strange considering the problems encountered during the late 1980's-early 1990's with the 1080 jam baits.

From both a Maori and to a lesser extent beekeeper perspective the failure by the Applicants to more prominently disclose the significant use of sugar in the manufacture of a number of the commonly used 1080 formulations such as the .06g cereal pellets and .06 - .08g and 1.5g pastes and identify the potential risks in the Assessment of Adverse Effects and Consultation reports is I believe a very serious omission.

This can be supported by a number of statements in Agency's Evaluation report regarding the sensitivity of bees and therefore all nectar eating invertebrates to 1080.

I understand the New Zealand beekeeping industry currently uses some 15,000 – 20,000 tonnes of sugar annually.

CONCERNS

Cereal Pellets

The commonly used .06g cereal pellet contains 18.75% sugar and the .2g pellet 42.2%. On a number of occasions I have observed the 6g pellets out in the field situation where after a light shower of rain (5 - 10 mm) they have partially disintegrated into a sticky/gluey blob on the ground which I suspect is very palatable to a wide range of nectar eating invertebrates and birdlife. Appendix C page 377 seems to indicate that 100 - 150mm of rainfall is required to leech most of the 1080 from these cereal baits.

During an aerial operation an unknown number of cereal pellets will become suspended in the forest canopy. The only comment or research I can locate on this issue is contained in appendix F page 513 where in a research trial (Shrubshall 1999) *in the Catlins* (some 3 km's north of trust's property) *recorded invertebrates from 21 orders caught in sticky traps in the canopy feeding on Wanganui No 7 cereal pellets, of which 44 individuals were confirmed as having ingested bait.*

It would appear that there is no field research as to the adverse effects on non-target invertebrates and native birds attracted to disintegrating 1080 cereal baits either in the canopy or on the ground.

Notman (1999) stated *very few compounds are known which exert such a variable pharmacological actions in different species as does sodium monofluoroacetate* (Egekeze & Ochme 1979). *Such variability of effect means that the actual degree of tolerance for each class of animal (species) can only be satisfactorily determined by experiments.*

Research (McIlroy) has shown that:

- Actual sensitivity (LD₅₀) to 1080 of any species in the field may bear no close relationship to pharmacological sensitivity. Consequently it is important to obtain the measures of sensitivity, particularly for non-target species under conditions closely resembling that experienced during actual 1080 poisoning programmes.
- Body size is particularly important in determining what a species needs to ingest to receive the equivalent of an LD₅₀ and therefore is likely to provide a better basis for evaluating the potential hazard they face from 1080 poisoning programmes than ranking them simply on sensitivity.
- Difficult to predict which non-target species will be most affected during a 1080 poisoning operation but can be gauged by assessing their ability to recover in terms of reproductive and dispersal capacities from a major reduction in numbers due to a poisoning operation.

Lloyd and McQueen (2000) *Secondary Poisoning of Insectivores Following an Aerial 1080 Possum Control Operation* state:

- Because of greater sensitivity to 1080 poisoning, bats are at much greater risk; a short-tailed bat will receive the medium lethal dose of 1080 from as little as 0.04 g (0.7% of its daily food intake) of arthropods containing 57ug g⁻¹ of 1080
- Where vulnerable populations of insectivores are present other methods of possum control such as trapping or the use of cyanide in bait stations should be considered.

Paste

6g - 8g and 1.5g pastes registration nos. V004811, V004812, and V004918 each contain 30% sweetener which is presumably sugar and are 66% apple based.

The Parliamentary Commissioner for the Environment's report (PCE) recommended to the Pesticides Board to de-register 1080 paste baits which were attractive to bees. Given that the 1080 apple based paste baits contain some 30% sugar which must be very attractive to a wide range of nectar eating invertebrates and birdlife why are these formulations still being used?

Unfortunately the Agency's reports do not contain any detailed discussion on 1080 pastes but there are number of scattered comments in various appendices such as:

Appendix C

(Page 351 Key Points) 1080 is highly toxic to terrestrial invertebrates based on acute oral honeybee and ant data.

(Page 421 Terrestrial Invertebrate Ecotoxicity) Despite the uncertainty in the data, the Agency considers that technical grade 1080 can be classified as 9.4A highly toxic to terrestrial invertebrates based on the acute oral honeybee and ant data.

Appendix F

(Page 485) The Agency notes that birds that feed on invertebrates may be affected by secondary poisoning (from consuming invertebrates containing 1080 residues) or primary poisoning (from direct ingestion of bait) or both.

Appendix N

(Page 722 Apple-based pastes) There have been calls to restrict the use of these pastes..... Morgan 2000 (page 722) recommends not using apple paste when the weather is likely to be hot dry and windy, or on very absorbent, dry, sandy soils due to bait dehydrating.

(Page 734) The authors recommend that Probait coated apple not be used without a more effective repellent.

(Page 753 Native Invertebrates) A wide range of species has been found feeding on all bait types.

Appendix Q

(Page 796) The Agency has identified the attractiveness of prepared non-toxic apple baits to native birds has been evaluated in cage trials.....the authors (of the study) recommend that apple bait should only be used in bait stations.

Appendix R

(Page 819 Controls relating to protection of terrestrial invertebrates e.g. beneficial insects)

Specifically. A person must not apply a class 9.4 substance in an area where bees are foraging and the substance is in a form which bees are likely to be exposed to it.

ADVERSE EFFECTS

Despite reliable scientific research indicating the potential of 1080 formulations especially paste and jam baits containing significant quantities of sweetener/sugar to poison nectar eating invertebrates such as bees, no attempt has been made by either the Applicants or the Agency to quantify the adverse effects on other nectar eating species of invertebrates and birds or the potential secondary effect on insectivorous birds.

The Agency Report contains a significant number of comments regarding gaps in the scientific data e.g.:

(Page 164) Submitters supporting and opposing the continued use of 1080 (particularly aerially) noted concern about the lack of research and information on the potential effects to native or valued species, waterways and ecosystems.

(Page 349) Many of the older data are of poor quality, with insufficient information presented in the literature to allow full

(Page 484) Deaths of individual birds have been reported frequently after pest control operations but generally do not give any indication of potential effects at a population level.

(Page 484) In many cases the conclusions that can be drawn from monitoring are limited by lack of replication and/or a lack of suitable control (untreated) blocks.

(Page 484) The agency does not have sufficient information to determine how frequently these problems may occur and what impacts they may have in terms of achieving pest control or on non-target species.

(Page 574) The justified use of 1080 to control pests must include consideration of the harms caused to target and non-target animals and of the efforts to minimize those harms.

(Page 721) Evaluation of literature on the effects of 1080 usage are complicated due to the variable reporting of the 1080 formulation used.

(Page 721 Birds at risk from exposure to 1080 baits) The nature of the risk varies depending on the bait used, the species' food and foraging habits.

(Page 723 Invertebrates) Due to the lack of uncertainty in the toxicity data for invertebrates, and the lack of information on amounts of bait likely to be eaten, the Agency has not attempted to assess direct exposure to invertebrates.

(Page 740) The toxicity of 1080 to native New Zealand birds has only been tested in two species. (Comment refer to Notman's and McIlroy's recommendations)

AGENCY ASSESSMENT OF ADVERSE EFFECTS ON THE RELATIONSHIP OF MAORI TO THE ENVIRONMENT

In terms of sections 6d and 8 of the HSNO Act 1996 the Authority when exercising powers and functions under the act as the decision-maker considering this application must take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi) when recognizing and providing the relationship of Maori and their culture and traditions with their ancestral lands, valued flora and fauna and other taonga.

One of principles which the Agency report has taken into account when considering the potential adverse effects of 1080 on taonga such as native invertebrates birdlife and mammals is that of active protection

The role of Iwi/hapu as kaitiaki is to maintain and enhance the mauri (life force) of their natural resources which includes birdlife and invertebrates so as to ensure the sustainability of the biodiversity of native forests etc for future generations both physically and spiritually.

Generally tangata whenua manage their natural resources in a holistic manner to avoid any degradation of the resource e.g. un-necessary killing or poisoning of taonga species such as native vertebrates, birdlife and bats which inhabit native forest ecosystems thereby maintaining or enhancing the mauri of the resource. Tangata whenua as kaitiaki accept that a significant reduction of possums, mustelids and other rodents is necessary to enhance our nations threaten ecosystems and reduce the threats to treasured indigenous species but would prefer to see control methods used which minimize the adverse risks to non-target native species.

The Applicants' Maori consultation process (ignoring its possible inadequacies) has identified a number of concerns regarding the use of 1080 poison. However as the Applicants failed to disclose during the consultation process that significant volumes of sugar were being incorporated into a number of commonly used 1080 formulations e.g. 6g cereal pellets and the resultant potential risks to native invertebrates and birdlife most Maori will be unaware of this issue.

The Agency report on page 258 10.5.1 Summary of Significant Adverse Effects on The Environment "with 1080" states:

- The most significant adverse environmental effects from the use of 1080 are potentially on native birds. Effects on bats and lizards could also be significant but there is more uncertainty about this.

- Adverse effects associated with uncontained ground-based use of 1080 are similar to those of aerial application.
- For contained methods the level of effect is estimated as one class less than for corresponding uncontained methods
- There is significant uncertainty around the relative risks of different methods of application.

Kaitiakitanga

The Agency report (page 154) states:

- The Agency recognises there are significant research gaps and areas of uncertainty with regard to potential adverse effects on taonga (including the physical and spiritual health and wellbeing of native and valued species and waterways). This lack of information makes fulfilling the role of kaitiakitanga more difficult, particularly given the concerns for the intergenerational costs (including, but not limited to financial cost) involved in protecting taonga.
- Having considered all available information the Agency considers the risks posed to kaitiakitanga by 1080 ground control operations to be insignificant
- With regard to the aerial distribution of 1080, the Agency considers a moderate adverse effect to kaitiakitanga is likely within existing controls. The associated level of risk is E (high).

(Page 164) states:

- The ability of Iwi/Maori to perform their intergenerational responsibilities as kaitiaki in protecting the environment, was the central theme of consultees, submitters and hui participants. In terms of the principle of active protection this not only applies to protecting the species or natural resources generally, but also to protecting Iwi/Maori culture and practice with regard to these species and resource.

Page 277 contains the following incorrect statement:

For example the Conservation Act 1987 has a 'give effect to' clause for Treaty of Waitangi issues, but when dealing with regional authorities to apply 1080 aerially authorities are required only to 'have regard for' Treaty issues under the Resource Management Act 1991.

Comment: Section 8 of RMA 1991 actually states 'shall take into account' which legally speaking is a stronger direction than 'have regard for'.

CONCLUSION

Given the known problems with 1080 raspberry jam baits poisoning invertebrates e.g. bees I find it rather strange that the Applicants have failed to more specifically assess the potential risks to native invertebrates and birdlife etc from 1080 formulations containing significant quantities of sugar.

In terms of sections 6d and 8 of the HSNO Act the Hearings Panel when considering the application is required to take into account the relationship of tangata whenua and their spiritual and cultural traditions with their valued flora, fauna and other taonga and consider mitigating any adverse effects in terms of the Treaty principles of partnership and protection.

The Agency's conclusions and suggested recommendations have failed in some respects to adequately mitigate many of the concerns raised in the report and/or appendices in relation to the adverse effects on native invertebrates, birdlife and bats resulting from the use of 1080 cereal pellets or pastes.

One suggested control which could potentially mitigate many of those adverse effects/risks is a substantial reduction in the volume of sugar contained in 1080 formulations under review to say 5% or less.

Dated at Dunedin this the 24th day of May 2007

**EJ PALMER
CHAIRPERSON**