The European Agency for the Evaluation of Medicinal Products
Veterinary Medicines Evaluation Unit

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COMMITTEE FOR VETERINARY MEDICINAL PRODUCTS

ALOE VERA GEL

SUMMARY REPORT

1. The leaves of *Aloe barbadensis* (synonyms: *Aloe vera, Aloe vulgaris*), a plant of the family of the *Liliaceae*, are the source of 2 different products with medicinal properties: a yellow latex-like juice obtained from the cells just beneath the epidermis of the leaves with laxative properties (synonym: Aloes), and the parenchyma, the inner part of the leaves consisting of a mucilaginous gel, *Aloe vera* gel (synonym: *Aloe vera* juice).

   The Committee for Veterinary Medicinal Products (CVMP) previously assessed Aloes and recommended its inclusion in Annex II of Council Regulation (EEC) No 2377/90 as follows:

Pharmacologically active substance(s)	Animal species	Other provisions
Aloes, Barbados and Cape, their standardised dry extract and preparations thereof	All food producing species	

   Subject of the present report is *Aloe vera* gel.

   Aloe vera gel is used topically for its anti-inflammatory and wound-healing properties, but it has also been used internally as a general tonic. The main constituents of *Aloe vera* gel are mucopolysaccharides (glucomannans, polymannoses, about 10% of total solids), enzymes, anthranoids, lignin, saponins, vitamins, amino acids (almost 50% of the total amount consisting of 8 of the 10 essential amino acids) and minerals (quantities not given). Total solids are in the range of 1.3 to 2%, the rest being water. *Aloe vera* gel is obtained either from hand-filleted leaves of *Aloe barbadensis* or by cold processing of the whole leaf, in which case the product usually also contains appreciable quantities of the latex material and anthranoids. The anthranoids in whole leaf extract of *Aloe vera* can however be reduced to levels below10 mg/kg in the product.

2. *Aloe vera* gel is used in veterinary medicine topically to promote wound healing on general skin wounds in all animals. It has also been recommended as a teat-dip in lactating cows, by intramammary administration for (adjuvant) treatment of mastitis or high somatic cell counts, and by oral route in all food-producing species as adjuvant treatment for a number of afflictions (ranging from anaemia to infertility, mastitis and shock).

   In human medicine *Aloe vera* gel is used topically to promote wound healing. Oral use as a general tonic for a number of indications, where scientific proof is outstanding, has also been described. *Aloe vera* gel is also widely used in cosmetics.

3. *Aloe vera* gel stimulates cell growth of basal keratinocytes *in vitro*. *Aloe vera* gel is also reported to have antibacterial, antifungal and antimycotic activity *in vitro*. *In vivo* oral administration of *Aloe vera* gel (juice) and aqueous whole leaf extract has been reported to lower blood glucose and serum lipid levels (in monkeys), and to be anti-ulcerogenic. However, the evidence is conflicting, as experiments in rats did not show such effects; further substantiation is necessary. Oral administration of *Aloe vera* gel is also claimed to have anti-arthritic properties.

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Additional properties are reported for individual constituents of *Aloe vera* gel. Aloctin A (a lecithin-like substance) has anti-inflammatory properties in rats. The glucomannans, in particular acemannan, contained in *Aloe vera* gel were shown to have immunomodulating (stimulating) properties *in vitro* and *in vivo*.

4. Pharmacokinetic information was only available for the anthranoid components of the latex juice of *Aloe barbadensis*, which are however not present in *Aloe vera* gel and are reduced to levels below 10 mg/kg in the whole leaf extract. No information on the pharmacokinetics of *Aloe vera* gel or its constituents was provided.

5. Pre-GLP studies on the acute toxicity of *Aloe vera* gel were available. The oral LD_{50} was greater than 21.5 g/kg bw in rats and greater than 31.6 g/kg bw in mongrel dogs. No toxic effect was noted at any dose level. Mortality in rats was not treatment-related, while no deaths occurred in dogs. Limited vomiting was observed in 2 dogs, though not at the highest dose. In rabbits, up to 10 g/kg bw *Aloe vera* gel administered to intact and abraded skin did not cause signs of toxicity. Minimal dermal irritation (slight transient erythema) was observed at the application site.

6. No data on the oral repeated dose toxicity of *Aloe vera* gel was provided. Summaries of repeated dose toxicity studies on acemannan, one of the mucopolysaccharides contained in the clear leaf gel of *Aloe vera*, in rats and dogs were available. Administration of 78% pure acemannan isolated from *Aloe barbadensis* to rats in the diet at a concentration of 5% for 14 days and at doses up to 2000 mg/kg bw/day for 6 months had no significant effect on any parameter measured. In dogs the same result was obtained for oral doses up to 1500 mg/kg bw, given for a period of 90 days.

   A pre-GLP study on repeated dermal administration of *Aloe vera* gel (0.25, 1 and 2 ml/kg bw) to intact or abraded skin of rabbits for 3 weeks (daily administration) and on intact skin for 13 weeks (administration on weekdays only) was provided. Slight transient dermal irritation (not does related) was the only effect noted. Microscopic examination of a number of organs including liver, kidney and skin did not reveal any treatment-related changes.

7. No information on the mutagenicity and carcinogenicity of aloe vera gel has been provided. Information was available with regard to anthranoids contained in *Aloe barbadensis* leaves, which are not contained in aloe vera gel and are reduced to levels below 10 mg/kg in the whole leaf extract. Considering the nature of the constituents of *Aloe vera* gel, whose chemical structures do not give rise to concern, no further information was requested.

8. No information on residues in edible tissues and their depletion following treatment of target animals was provided, however only limited absorption of *Aloe vera* gel constituents is expected after topical administration. However, the information on pharmacokinetics and potential residues is insufficient with respect to other routes of administration.

Conclusions and recommendation

Having considered the criteria laid down by the Committee for Veterinary Medicinal Products for the inclusion of substances in Annex II of Council Regulation (EEC) No 2377/90 and in particular that:

- *Aloe vera* gel is used in a small number of individual animals, infrequent or non-regular treatments when used topically to promote wound healing,
- the animals treated with *Aloe vera* gel are unlikely to be sent for slaughter during or immediately after treatment,
- *Aloe vera* gel and its constituent acemannan are of very low oral toxicity while the main toxic constituents of *Aloe barbadensis*, the anthranoids, are reduced to levels below 10 mg/kg in whole leaf extract;

the Committee for Veterinary Medicinal Products concludes that there is no need to establish an MRL for *Aloe vera* gel or whole leaf extracts of *Aloe vera* and recommends its inclusion in Annex II of Council Regulation (EEC) No 2377/90 in accordance with the following table:

Pharmacologically active substance(s)	Animal species	Other provisions
Aloe vera gel and whole leaf extract of *Aloe vera*	All food producing species	For topical use only