

## STUDY 1.

# DEVELOPMENT OF AN ARTIFICIAL CANINE SKIN MODEL TO INVESTIGATE THE SKIN BARRIER IN BEAGLES

Skin barrier function depends on the outermost layer of skin, called the stratum corneum, which consists of corneocytes embedded in a lipid matrix. These lipids are mainly ceramides, cholesterol and free fatty acids. **Atopic dermatitis can affect the total quantity of lipids in the stratum corneum** or their relative concentrations, increasing skin dehydration and the penetration of skin allergens. Several studies have suggested that different nutrients may strengthen skin barrier function. In order to study the effects of various compounds on the canine skin barrier, **Affinity's research department has promoted the development of an artificial canine skin model<sup>1</sup>** to facilitate these studies without having to harm any animals by performing skin biopsies (Figure 1).

We used this model to compare the lipid composition of the canine epidermis with that of other species

and with artificial canine skin (Table 1), while also examining the effect of the oral administration of various functional ingredients on skin health.

### RESULTS

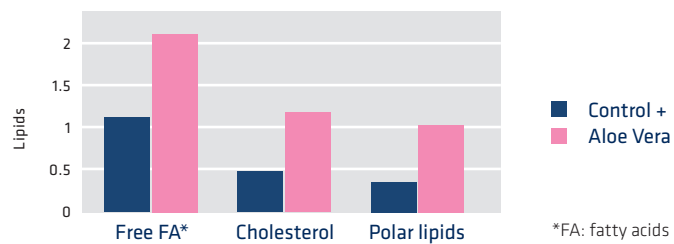
We used the artificial skin to test a range of active substances, such as aloe vera, that we subsequently incorporated into the ATOPIC CARE veterinary diets (Graph 1).

**Table 1.** Epidermal lipids in different species and the artificial canine skin model. Internal data.

Genus	Epidermis			Artificial Skin
	Human	Porcine	Canine	Canine
% Total lipids	19.3	15.2	11.65	17.6
% Free *FA	33.25	22.64	47.2	38.22
% Cholesterol	33.28	36.15	21.68	30.72
% Polar lipids	33.47	41.2	35.45	30.73

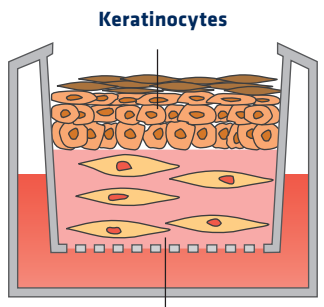
\*FA: fatty acids

**Graph 1.** Effect of aloe vera gel supplementation on artificial canine skin cultures in terms of total composition of the main lipids in the canine epidermis and dermis. (Internal data)



\*FA: fatty acids

**Figure 1.** Artificial canine skin model used in different studies.



**Biomatrix: collagen and fibroblasts**

Serra *et al* (2007) Experimental Dermatology 2007. 16: 135-142.

### Infographic. CAD skin evolution.

