Current Review and Evidence

VETERINARY HAEMOSTATS

Gelatin-based haemostats represent one of the most established and versatile topical agents for the control of surgical bleeding in both human and veterinary medicine. Gelatin-based haemostats purified porcine or bovine adhere effectively to bleeding tissue and can absorb up to **45** times their own weight in blood[7]. Their highly porous matrix provides a large surface area that promotes rapid activation of platelets (thrombocytes) upon blood contact, supporting the formation of a stable clot and facilitating local haemostasis[1]. This combination of strong absorbency, conformability and platelet activation makes gelatin haemostats a reliable adjunct for controlling capillary, venous and parenchymal bleeding across a wide range of surgical applications.

Mechanism of action

Gelatin-based haemostats achieve rapid haemostasis through a combination of physical absorption and biochemical activation of the coagulation cascade. Upon contact with blood, the gelatin matrix or porous gelatin microspheres (PGMs) rapidly absorb plasma, concentrating platelets and coagulation proteins within their interconnected pores. The porous, rough surface promotes adhesion of red blood cells and platelets and triggers activation of coagulation factor XII, leading to the generation of thrombin and subsequent fibrin polymerisation. This process forms a stable fibrin clot, reinforced by the physical barrier of the gelatin scaffold[5].

The open-cell structure enhances platelet aggregation and local clotting factor concentration, initiating fast thrombus formation. When combined with topical thrombin, clotting is further accelerated. The figure illustrates this sequence—from active bleeding to fibrin-rich clot formation—showing how gelatin matrices promote cell aggregation, fibrin deposition and effective wound sealing. Collectively, these mechanisms enable gelatin-based haemostats to provide rapid, reliable haemostasis with structural stability and tissue compatibility compared with conventional non-porous formulations[1&7].

Gelatin: The Leading Haemostat in Veterinary Surgery

Gelatin, a hydrocolloid derived from partially hydrolysed porcine collagen, is available in sponge and powder forms for versatile haemostatic use. That said, gelatin can expand to twice its original size, creating an effective physical barrier to bleeding. The sponge form can be cut to fit any wound, applied dry or moistened and achieves haemostasis rapidly with light pressure. Fully absorbable within 4–6 weeks, gelatin is safe, biocompatible and easy to handle[7].Gelatin products offer low cost, room-temperature stability and dependable performance[6].

Studies

A study by Charlesworth et al., reviewed the clinical use of absorbable gelatin sponges as haemostatic implants in dogs and cats, analysing outcomes from 50 surgical cases. The results demonstrated high haemostatic success (98%) with no postoperative complications or adverse reactions, confirming that gelatin sponges are a safe and effective option for achieving haemostasis in veterinary surgical patients[3&6].

Another study by Hoshi evaluated the effectiveness of a gelatin/β-tricalcium phosphate (β-TCP) sponge scaffold combined with fibroblast growth factor-2 (FGF-2) in promoting alveolar ridge augmentation in dogs following tooth extraction. The results showed significantly greater new bone formation and reduced defect height compared with controls, demonstrating that the gelatin-based scaffold provided superior support for tissue regeneration and healing, confirming its strong potential as a biocompatible and effective haemostatic and regenerative material in veterinary dental surgery[4].

Action of Gelatin-Based Haemostats

(Li et al.2020)

Comparison of Common Veterinary Haemostats

This chart compares common veterinary haemostatic agents by their base material, mechanism, advantages, limitations and cost[7&6].

Base Material	Form / Mechanism	Key Advantages	Limitations	Cost / Availability (UK)
Oxidised regenerated cellulose (ORC)	Mesh/fabric that swells and lowers pH to promote platelet activation	Bactericidal environment; resorbs in 1–2 weeks	Acidic → may delay healing in confined sites; less effective on heavy bleeds	Moderate
Oxidised cellulose polymer	Fabric/patch haemostat; physical matrix promoting clotting	Strong adherence to flat surfaces; sterile ready-to-use	Can swell; acidic; limited use in deep cavities	High
Plant-derived polysaccharide hydrogel (alginate-based)	Injectable gel forming instant mechanical seal	Instant haemostasis; transparent; ideal for superficial bleeds	Very expensive; not absorbable	High
Microporous polysaccharide powder (potato starch)	Powder that dehydrates blood to concentrate clotting factors	Works rapidly; resorbs in 24–48 h	Poor adherence to vertical surfaces; risk of dislodgement	Moderate–high
Gelatin-based	Absorbable matrix; platelet activation & fibrin support	Excellent adherence; absorbs ×40–45 blood; cost-effective; neutral pH	Not for use intravascular	Low–moderate
	Sponge/ powder/ gel	Proven efficacy; resorbs 2–6 weeks; biocompatible		

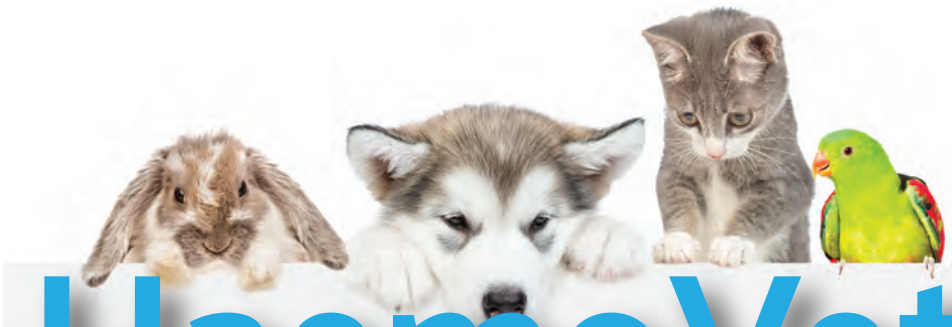
Comparative Material Characteristics

Gelatin haemostats represent the most balanced and effective haemostatic option, offering rapid, controlled haemostasis, excellent tissue adherence and biological compatibility at a low cost — making them particularly advantageous for veterinary surgical applications where versatility and safety are key.

Feature	Gelatin Sponge	Starch-Based Powder	Oxidised Regenerated Cellulose
Primary mechanism	Physical matrix; platelet activation; clot support	Dehydrates blood; concentrates clotting factors	Acidic cellulose matrix promoting platelet adhesion
Absorbency	≈ 45 × own weight (Vyas & Saha 2013)	Moderate; acts by desiccation	Moderate
Adherence to tissue	Excellent — conforms and stays in place	Limited — powder may dislodge	Good on flat surfaces
Time to haemostasis	1–3 min (with pressure)	< 1 min (diffuse oozing)	2–5 min
Resorption	2–6 weeks	24–48 h	1–2 weeks
pH / tissue effect	Neutral	Neutral	Acidic (bactericidal but may irritate)
Cost (UK)	Low	Mid	Mid–High
Ideal applications	Liver, spleen, dental sockets, soft tissue	Diffuse surface oozing, laparoscopic fields	Capillary oozing, flat planes
Main limitations	Not for heavy arterial bleeding	Poor adherence; embolic risk if intravascular	Swelling in confined spaces

References

1) Akriti Nepal, et al. “Advances in Haemostatic Sponges: Characteristics and the Underlying Mechanisms for Rapid Haemostasis.” *Bioactive Materials*, vol. 27, 1 Sept. 2023, pp. 231–256
2) Anderson, Thomas S, et al. “A Randomized Comparison of an Adhesive Gelatin Sponge and a Plain Collagen Sponge for Haemostatic Control during Canine Liver Surgery.” *Veterinary Surgery : VS*, vol. 54, no. 2, Feb. 2025, pp. 345–353
3) Charlesworth, T. M., et al. “The Use of Haemostatic Gelatin Sponges in Veterinary Surgery.” *Journal of Small Animal Practice*, vol. 53, no. 1, 27 Dec. 2011, pp. 51–56.
4) Hoshi, S, et al. “Ridge Augmentation Using Recombinant Human Fibroblast Growth Factor-2 with Biodegradable Gelatin Sponges Incorporating β-Tricalcium Phosphate: A Preclinical Study in Dogs.” *Journal of Periodontal Research*, vol. 51, no. 1, Feb. 2016, pp. 77–85
5) Li, Lin, et al. “Preparation and the Haemostatic Property Study of Porous Gelatin Microspheres Both in Vitro and in Vivo.” *Colloids and Surfaces B: Bio interfaces*, vol. 187, Mar. 2020.
6) LyBarger, Kristopher. “Review of Evidence Supporting the Arista™ Absorbable Powder Haemostat.” *Medical Devices*, vol. Volume 17, 1 May 2024.
7) Vyas, Krishna S, and Sibu P Saha. “Comparison of Haemostatic Agents Used in Vascular Surgery.” *Expert Opinion on Biological Therapy*, vol. 13, no. 12, 22 Oct. 2013, pp. 1663–1672.



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