

Canine and Feline Freeze-dried Bone Allograft the most cost-effective way to induce bone formation

The Science

Demineralised bone matrix (DBM) is prepared by Veterinary Tissue Bank from ethically-sourced donor cortical bone. A careful process of cell, lipid and mineral removal, releases growth factors within bone such as BMP-2 and TGF β 1 that induce bone formation. The species-specific nature of these growth factors ensures optimal binding to host receptors. Studies on DBM have shown that:

- DBM is osteoinductive¹
- DBM provides species-specific growth factors²
- DBM is effective³

The efficacy of DBM is traditionally assessed by placement into epaxial muscles of nude rats. Even in this challenging situation, DBM is able to induce ectopic bone formation

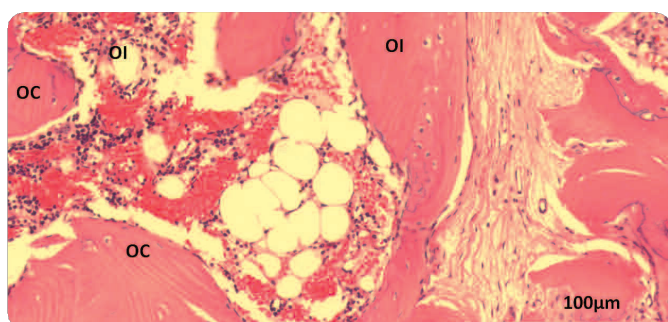


Figure 1. Demineralised bone matrix (DBM) was implanted in biceps femoris muscle of a nude rat and sections taken at 28 days. The slide (haematoxylin and eosin) shows the implanted demineralised bone matrix (DBM) with empty lacunae (processing of the DBM destroys viable cells). However, there is clear evidence of osteoinduction (OI) with the presence of new woven and lamellar bone with osteocytes within lacunae. Furthermore, some of the new bone is laid down adjacent to the DBM indicating osteoconduction (OC). In addition, bone marrow, chondroblasts, osteoblasts, osteoclasts and neovascularisation are visible.

Although the effect of DBM cannot be explained by the action of a single growth factor, we have recently measured the BMP-2 content of canine DBM. We demonstrated the presence of BMP-2 within the canine DBM in nanogram (10^{-9}) quantities; it is known that growth factors are biologically active in pictogram (10^{-12}) quantities.

Thus DBM is likely to provide supraphysiological quantities of BMP-2.

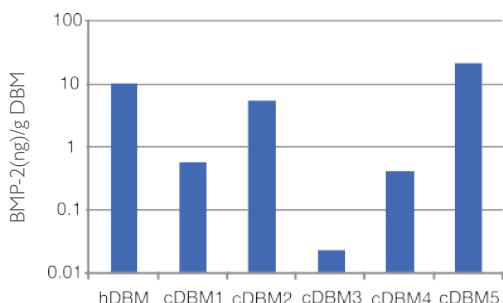


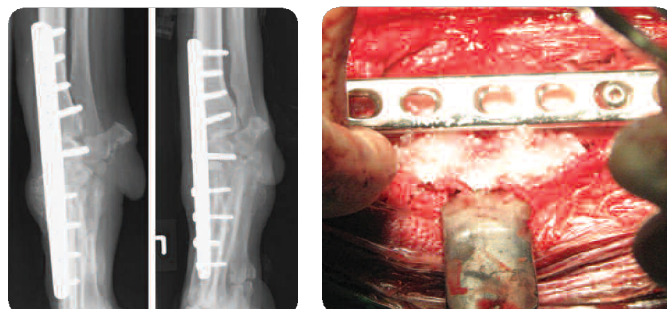
Figure 2. BMP-2 concentrations measured by ELISA in 5 different batches of canine DBM (cDBM). A single sample of human DBM (hDBM) was used as a positive control. Although concentrations vary, the minimum concentration was over 10pg/g. (The assay is designed for human BMP-2 and actual cDBM concentrations may be higher than measured due to reduced antibody activity.)

Clinical uses of DBM and cancellous chips

DBM can be used in a variety of situations:

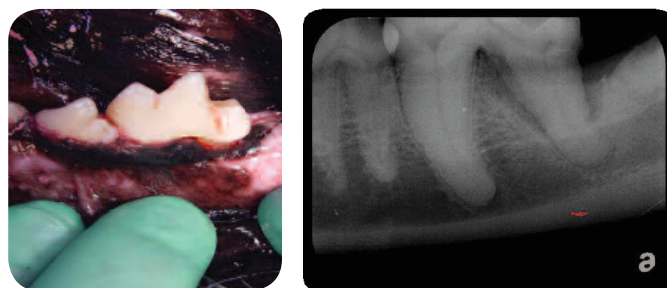
• Orthopaedic uses:

- Small joint arthrodesis (carpus, tarsus)
- Grafting around reconstructed fractures in adult dogs
- Composite grafting with cancellous chips:
 - Large joint arthrodesis (shoulder, elbow, stifle)
 - Filling fracture gaps (buttress fixation)



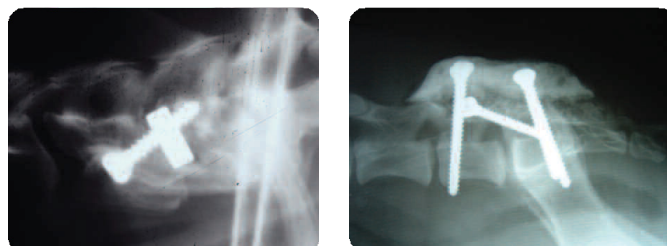
• Dental uses:

- Extraction socket grafting
- Ridge and sinus augmentation
- Bony defects
- Periodontal regeneration



• Neurosurgical uses:

- Atlantoaxial subluxation
- Cervical spinal fusion (Wobbler syndrome)
- Thoracolumbar fusion (Type II disc disease)
- Lumbosacral fusion (LS compression)



References

1. Innes J, Myint P. Demineralised bone matrix in veterinary orthopaedics: A review. *Veterinary and Comparative Orthopaedics and Traumatology* 23:393-399, 2010.
2. Clayton J, Redmond C, Myint P, Innes J. Assessment of the osteoinductive properties of freeze-dried canine demineralised bone matrix (DBM), in Vezzoni A (ed): 3rd World Veterinary Orthopaedic Congress, Vol. Bologna, Italy, ESVOT, 2010.
3. Hoffer MJ, Griffon DJ, Schaeffer DJ, Johnson AL, Thomas MW. Clinical applications of demineralized bone matrix: A retrospective and case-matched study of seventy-five dogs. *Veterinary Surgery* 37:639-647, 2008.



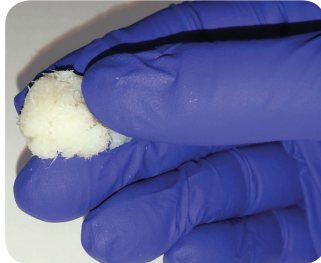
About Veterinary Tissue Bank

Veterinary Tissue Bank is Europe's first tissue bank dedicated to helping companion animals.

Products are available in various presentations, and have many applications from use during procedures such as TTA rapid and joint arthrodesis to dealing with the difficult non-union case.



Demineralised Bone Matrix (DBM) is cortical bone which has been cut, milled into fine particles and washed to remove soft tissues, cells and marrow elements. Further processing removes minerals to leave collagen matrix and endogenous bone growth factors such as bone morphogenic proteins. DBM is used where osteoinduction is required but the graft does not require any structural properties, for example in small joint arthrodesis.



DBM Fibres

DBM fibres are made from cortical bone and contain Osteoinductive growth factors such as BMP2 and BMP7.

Unlike DBM particulates the long fibres are entangled to form an effective Osteoconductive scaffold for greater cell migration. In addition, the fibres are easier to handle, forming a putty like texture upon rehydration without needing to add synthetic carriers. The fibres stay in situ resisting disintegration during irrigation.

Key Indications:

- DBM fibres are used in a wide range of orthopaedic procedures where fusion of bone or joint is to be achieved. Some examples are: arthrodesis, spinal fusion, fracture repair, etc.
- DBM fibres may be mixed with cancellous chips as a graft extender in filling large bone defects.
- The unique texture of DBM fibres is ideal for mixing with bone marrow or PRP to enhance performance.

Cancellous Chips

Cancellous Chips offer structure to a graft as well as providing a scaffold for osteoconduction.

This is available in canine and feline variants. Canine is available in 3 chip sizes for closer matching to defect size, and 3 pack sizes. The product consists of morcelised cancellous bone, processed to remove soft tissue, cells and marrow elements, freeze-dried and irradiated after packing for sterility.

Useful in TTA Rapid, filling corrective osteotomies, fracture repair, spinal fusions among other procedures. It is also useful for extending an autograft where harvesting has not produced sufficient material.

Available now from Vi! Contact us today to place your order!

Code	Description	QTY
C1201	VTB DBM Fibres 1cc	
C1203	VTB DBM Fibres 3cc	
C1205	VTB DBM Fibres 5cc	
C0901	DBM Canine 0.1-0.5mm Granules 1cc	
C0903	DBM Canine 0.1-0.5mm Granules 3cc	
C1001	DBM Canine 0.5-1.0mm Granules 1cc	
C1003	DBM Canine 0.5-1.0mm Granules 3cc	

Code	Description	QTY
C0101	Cancellous Chips Canine 2-4mm Chip Size Coarse 1cc	
C0103	Cancellous Chips Canine 2-4mm Chip Size Coarse 3cc	
C0201	Cancellous Chips Canine 1-2mm Chip Size Medium 1cc	
C0203	Cancellous Chips Canine 2-4mm Chip Size Medium 3cc	
C0301	Cancellous Chips Canine <1mm Chip Size Fine 1cc	
C0303	Cancellous Chips Canine <1mm Chip Size Fine 3cc	
FL105	Cancellous Chips Feline <2mm Chip Size Fine 1cc	

All products are subject to availability. Feline products are often in short supply.

Contact Name

Clinic Name

Email

Telephone Date

Do more • Treat better •

Toll Free 1800 785 642 **Fax** +61 7 3319 1519 **Email** vi@provet.com.au



A **covetrus** Company