

Lung Recovery with BerriQi®

What is BerriQi®?

BerriQi® is a proprietary patent-pending combination of Boysenberry and apple juice concentrates. It contains Boysenberry and apple polyphenols blended in a specific ratio for maximum efficacy towards supporting normal post-inflammatory lung repair.

What does BerriQi® do?

BerriQi® may activate our lungs' post-inflammation repair mechanisms. It has been tested in pre-clinical models of airway inflammation stimulated by airway allergens. Outcomes of **BerriQi®** consumption were:

- **BerriQi®** reduced infiltrating inflammatory cell numbers around airways in acute and chronic allergen exposure models
- **BerriQi®** reduced airway mucus in acute and chronic allergen exposure models
- **BerriQi®** improved breathing parameters in acute allergen exposure models
- **BerriQi®** activated the repair mode of alveolar macrophages in chronic allergen exposure models
- **BerriQi®** reduced post-inflammatory lung scarring in chronic allergen exposure models

How does BerriQi® work?

BerriQi® contains Boysenberry anthocyanins and ellagitannins plus apple procyanidins. Collectively these have been shown to contribute to various molecular pathways and cellular mechanisms related to the resolution of inflammation and post-inflammatory repair of airway tissue.

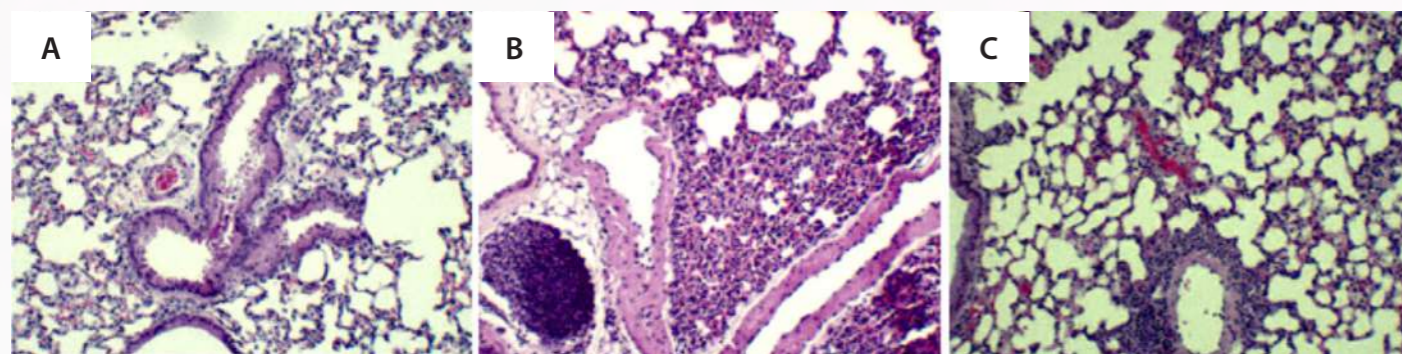
Why so effective for lungs?

This is because after the **BerriQi®** bioactives are absorbed in the gut, they travel via the liver and right side of the heart to the lungs, before returning to the left side of the heart and then being distributed through the rest of the body. This initial pulmonary circuit means that our lungs are the first post-liver and heart organ to receive the benefit of the **BerriQi®** bioactives. Our lung blood supply is designed with maximum surface-area-to-volume ratio to facilitate the exchange of gases, and this also means this same blood supply can maximally distribute bioactives to the airway tissues.

Recommended daily intake

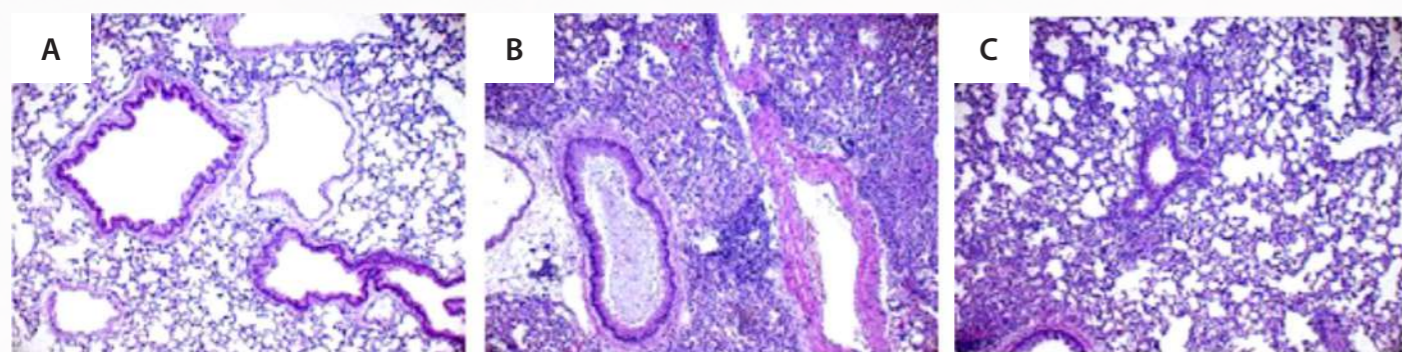
A recommended daily intake value does not yet exist. Our recommended bioactive daily dose of **BerriQi®** (based on preclinical efficacy) is 7.4 g of **BerriQi®** concentrate.

Reduction of infiltrating inflammatory cells



BerriQi® reduces infiltrating immune cells following acute airway inflammation. Figure shows Haematoxylin & Eosin (H&E) immune cell staining of mouse lung tissue. (A) shows naïve lung tissue with **minimal immune cell infiltration**; (B) shows tissue stimulated by a single acute exposure to allergen

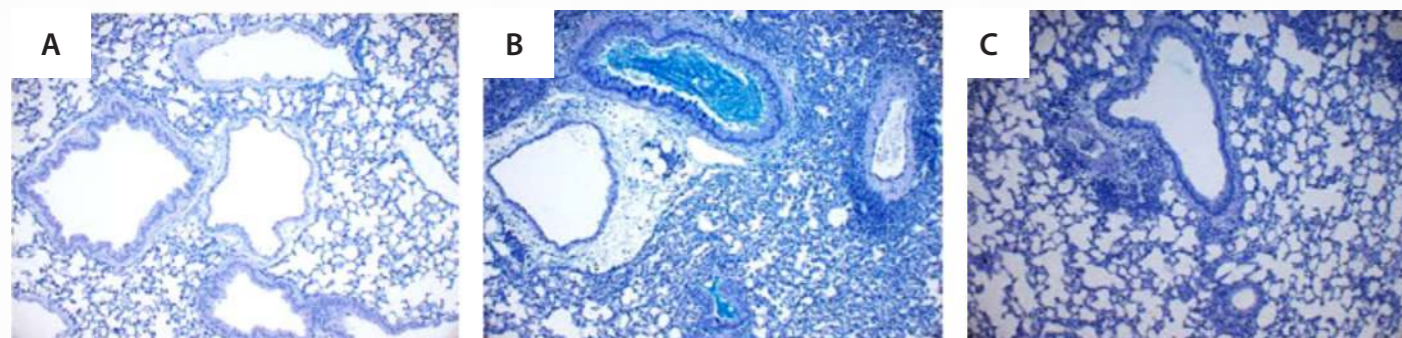
with **much immune cell infiltration** and tissue edema; and (C) shows acutely allergen-stimulated lung tissue two days after consumption of the second of two doses of BerriQi® two days apart with **much reduced immune cell infiltration**.



BerriQi® reduces infiltrating immune cells following chronic airway inflammation. Figure shows Haematoxylin & Eosin (H&E) immune cell staining of mouse lung tissue. (A) shows naïve lung tissue with **minimal immune cell infiltration**; (B) shows tissue stimulated by eleven exposures to allergen

(once weekly for 11 weeks) **packed with infiltrating immune cells** and tissue edema; and (C) shows chronically allergen-stimulated lung tissue after consumption of BerriQi® three times per week for the past five weeks with **reduced immune cell infiltration**.

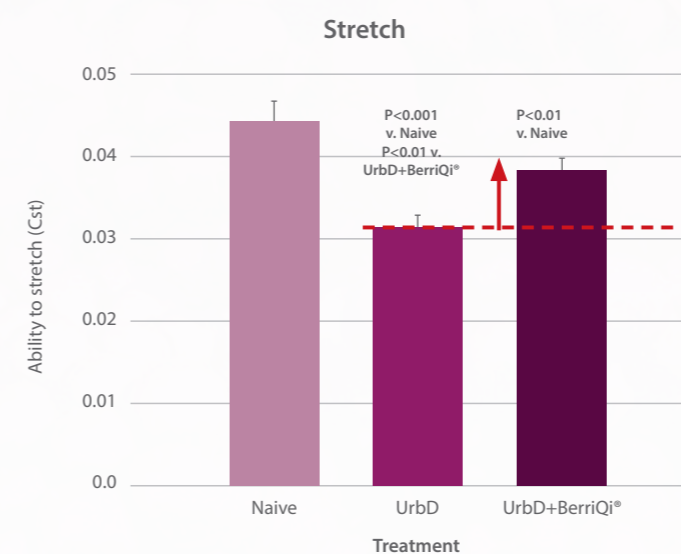
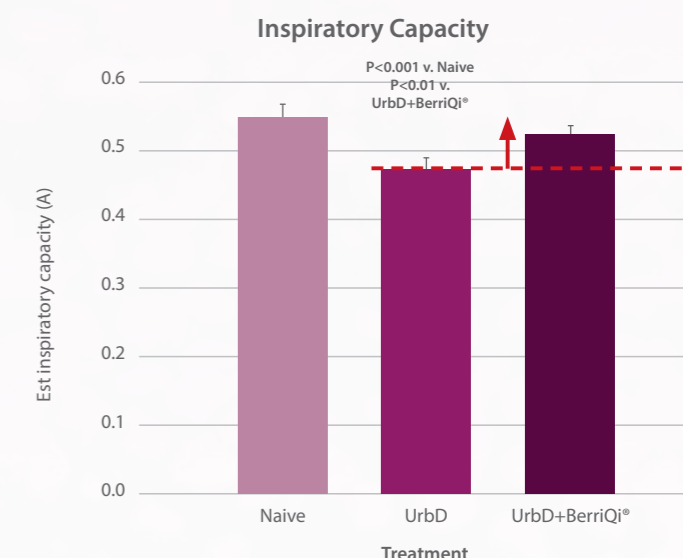
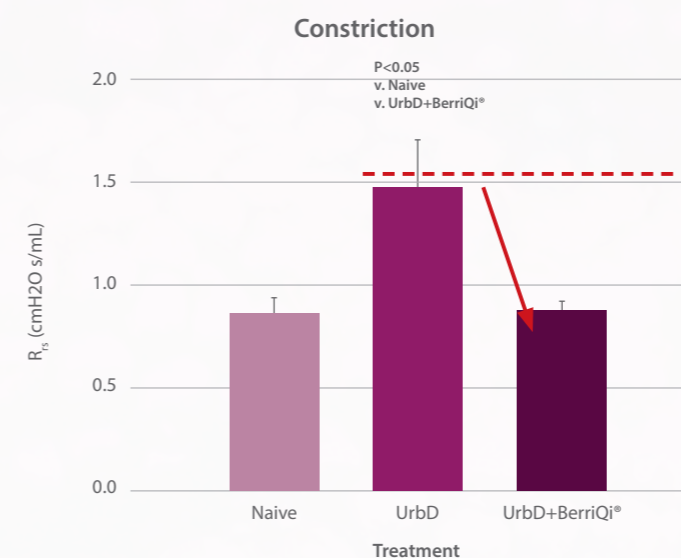
Reduction of airway mucus



BerriQi® reduces airway mucus following chronic airway inflammation. Figure shows Alcian Blue and Periodic acid-Schiff (AB-PAS) mucus staining of mouse lung tissue. (A) shows naïve lung tissue with **minimal mucus** in airways and the mucus-producing goblet cells lining the airways; (B) shows tissue stimulated by eleven exposures to allergen (once weekly

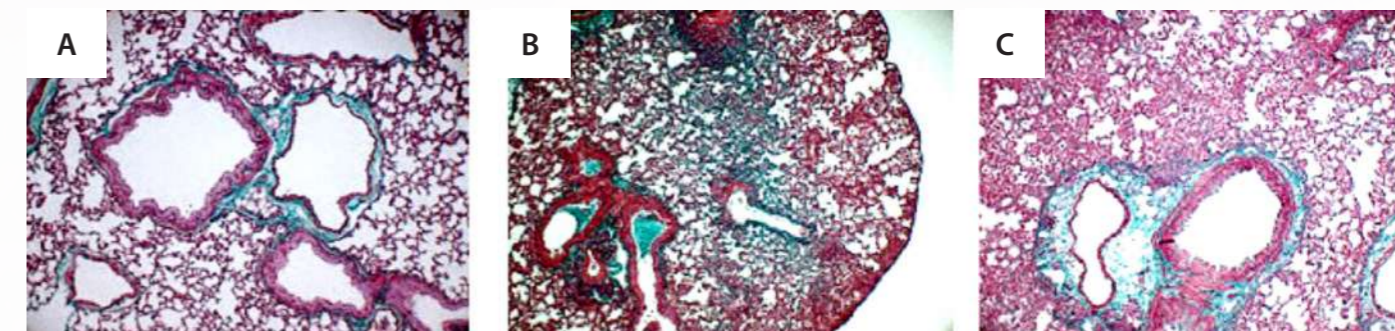
for 11 weeks) with **mucus-filled airway** strongly staining blue (indicated by black arrow); and (C) shows eleven-week chronically allergen-stimulated lung tissue after consumption of BerriQi® three times per week for the last five weeks with **minimal mucus** in airway, similar to naïve lungs.

Improvement of breathing parameters



BerriQi® improves breathing parameters after acute allergen stimulation of mouse lungs with urban dust (UrbD). Within each graph, the leftmost bar shows naïve lung ability, central bar shows acutely allergen-stimulated lung ability and rightmost bar shows allergen stimulated lung ability after BerriQi® consumption. Left graph shows units of constriction (R_{rs}, respiratory system resistance) are returned to normal. Central graph shows lung ability to stretch increased to close to normal. Rightmost graph shows estimated lung inspiratory capacity, the amount of air that can be breathed in after a normal breath out, is increased to close to normal.

Reduction of scarring



BerriQi® reduces airway scarring and strengthens airways following chronic airway inflammation. Figure shows Masson's trichrome collagen staining of mouse lung tissue. (A) shows naïve lung tissue with minimal collagen staining green except around airways where it forms structural support; (B) shows tissue stimulated by eleven exposures to allergen (once weekly

for 11 weeks) with collagen scarring shown by green staining throughout tissue; and C shows eleven-week chronically allergen-stimulated lung tissue after consumption of BerriQi® three times per week for the last five weeks showing no collagen scarring and increased collagen strengthening as green staining around airways.

Further reading

Shaw et al., 2020, Boysenberry and apple juice reduces ovalbumin-induced immune cell infiltration into the lung. [submitted for publication]

Shaw et al., 2016, Boysenberry ingestion supports fibrolytic macrophages with the capacity to ameliorate chronic lung remodelling. *Am. J. Physiol. Lung. Cell Mol. Physiol.* 311. L628-L638. DOI:10.1152/ajplung.00309.2015

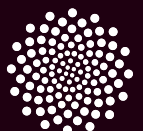
Coleman et al., 2016, The in vitro evaluation of isolated procyanidins as modulators of cytokine-induced eotaxin production in human alveolar epithelial cells. *J. Berry. Res.* 6, 115-124. DOI:10.3233/JBR-160121.

Coleman et al., 2016, Procyanidin A2 modulates IL-4-induced CCL26 production in human alveolar epithelial cells. *Int. J. Mol. Sci.*, 17, 1888. DOI:10.3390/ijms17111888.

Sawyer et al., 2017, Suppression of CCL26 and CCL11 generation in human alveolar epithelial cells by apple extracts containing procyanidins. *J. Func. Foods.* 31, 141-151. DOI:10.1016/j.jff.2017.01.036

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