



Can diet improve chronic pain?

Dr Rowena Field, Dr Fereshteh Pourkazemi, Assoc. Prof. Kieron Rooney



What do we know about chronic pain patients?

- ❖ Diet not perceived as a contributing factor
- ❖ 56% reported 'good' health but average of 3 comorbidities
- ❖ Average BMI >30 with weight gain since pain onset
- ❖ 76% rated diet either 'good' or 'excellent' but this not reflected in the habitual diet

Field R, et al. Participants with chronic pain do not perceive diet as a contributing factor to their pain: a survey-based study. *Pain Management*. 2020;10(3):195-204



What do we know about diets for pain?

- ❖ There is an overall positive effect of whole-food diets on pain, with no single diet standing out in effectiveness. This suggests that commonalities among approaches (e.g., diet quality, nutrient density, weight loss) may all be involved in modulating pain physiology

Field R, et al. Dietary Interventions Are Beneficial for Patients with Chronic Pain: A Systematic Review with Meta-Analysis. *Pain Med*. 2020;22(3):694-714



What do animal models teach us about a KD effect on the nervous system?

14 broad themes for mechanisms of action:

- ❖ Cellular energetics & metabolism
- ❖ Biochemical changes
- ❖ Cortical excitability
- ❖ Epigenetic regulation
- ❖ Mitochondrial function
- ❖ Neuroinflammation
- ❖ Neuroplasticity & structural integrity
- ❖ Neuroprotection
- ❖ Neurotransmitter function
- ❖ Nociception
- ❖ Redox balance
- ❖ Signalling pathways
- ❖ Synaptic transmission
- ❖ Vascular supply

Field R, et al. Ketogenic diets and the nervous system: a scoping review of neurological outcomes from nutritional ketosis in animal studies. *Nutr Res Rev*. 2021;1-39.



What do human studies teach us about a KD effect on the nervous system?

- ❖ 64 trials reporting neurological outcomes with 83% showing improvement
- ❖ 63 trials reporting inflammatory biomarkers with 71% reporting reduced inflammation

Field R, Field T, Pourkazemi F, Rooney K. Low-carbohydrate and ketogenic diets: a scoping review of neurological and inflammatory outcomes in human studies and their relevance to chronic pain. *Nutr Res Rev*. 2022;1-25.



Effects of a low-carbohydrate ketogenic diet on reported pain, blood biomarkers and quality of life in patients with chronic pain: A pilot randomised clinical trial.

- ❖ Whole food (WFD) vs whole food well-formulated ketogenic diet (WFKD) (n=27)
- ❖ Average pain reduced and quality of life improved for both groups which was still significant at 3-months follow-up
- ❖ WFKD also had significant improvements on depression and anxiety, inflammatory markers and weight loss
- ❖ Retention rates: WFKD 93%, WFD 89%. Adherence: WFKD 82%, WFD 87%. Enjoyment : WFKD 66%, and WFD 81%
- ❖ Barriers WFKD: knowledge integration, time management, navigating social food environments and emotional attachment to eliminated foods. Facilitators: structured support and coaching, and comprehensive learning materials.

Field R, Pourkazemi F, Rooney K. Effects of a low-carbohydrate ketogenic diet on reported pain, blood biomarkers and quality of life in patients with chronic pain: A pilot randomised clinical trial rationale, study design and protocol. *Eur J Integr Med*. 2021;45:101346.
Field R, Pourkazemi F, Rooney K. Effects of a low-carbohydrate ketogenic diet on reported pain, blood biomarkers and quality of life in patients with chronic pain: A pilot randomised clinical trial. *Pain Med*. 2022;23(2):326-38.
Field R, Field T, Pourkazemi F, Rooney K. The experience of participants with chronic pain in a pilot randomised clinical trial of a low-carbohydrate ketogenic diet. *Pain Manag*. 2021;12(3):313-22.
Turton J, Field R, Struik NA, Parker H, Rooney K. Formulating Nutritionally Adequate Low-Carbohydrate Diets: An Analysis of the Australian Food Composition Database. *Biomedical Journal of Scientific & Technical Research*. 2022;44(1).