

## **UKNHCC scientific opinion: beta-glucan from oats or barley and reduction of blood glucose rise after a meal**

Scientific opinion on the modification of the authorisation of a health claim related to beta-glucan from oats or barley and the reduction of the blood glucose rise after a meal pursuant to Article 13(1) of Regulation (EC) No 1924/2006 following a request in accordance with Article 19 of retained Regulation (EC) No 1924/2006, as amended by the Nutrition (Amendment etc.) (EU Exit) Regulations 2019 and the Nutrition (Amendment etc.) (EU Exit) Regulations 2020.

### **Annex information**

We use the following abbreviations and acronyms in the annex:

- avCHO: available carbohydrate
- BB: barley balance (beta-glucan concentrate)
- BG: beta-glucan
- CB: common barley
- EPS: exopolysaccharides
- GG: glucagel (beta-glucan concentrate)
- iAUC: incremental area under the curve

- OBC: oat bran concentrate
- RoB: risk of bias
- WWB: whole wheat bread

## Annex: overview of evidence considered pertinent by the committee

Study (first author, year)	Number of participants	Dose of BG(g) per avCHO(g) and description of test meal [note 1]	% change in blood glucose iAUC vs comparator	% change in peak glucose vs comparator	% change in insulin iAUC vs comparator	Risk of bias [note 2]
Ekström, 2017	13	1.92g per 30g Oat fibre bread containing 2.6% BG, served with 250mL tap water	37.5% reduction (statistically significant, $p < 0.05$ )	34.9% reduction (statistically significant, $p < 0.05$ )	48.3% reduction (statistically significant, $p < 0.05$ )	Overall RoB – some concerns Domain 1: some concerns Domain S: some concerns Domain 2: some concerns Domain 3: low Domain 4: low Domain 5: some concerns
Granfeldt, 2008 (series 1)	19	1.8g per 30g Muesli containing BG, yogurt, and white wheat bread with butter and cheese, served with 150mL water and 150mL tea or coffee	16.7% reduction	Not reported	6.3% reduction	Overall RoB – some concerns Domain 1: some concerns Domain S: some concerns Domain 2: some concerns Domain 3: low Domain 4: low Domain 5: some concerns

Study (first author, year)	Number of participants	Dose of BG(g) per avCHO(g) and description of test meal [note 1]	% change in blood glucose iAUC vs comparator	% change in peak glucose vs comparator	% change in insulin iAUC vs comparator	Risk of bias [note 2]
Lindstrom, 2015 [note 3]	19	1.8g per 30g Fermented oat bran beverage with white bread  1.8g per 30g Fermented oat bran beverage with EPS and white bread	16.1% increase  17.4% increase	12.5% increase  20.8% increase (statistically significant, p<0.05)	16.7% reduction  12.3% reduction	Overall RoB – some concerns Domain 1: some concerns Domain S: some concerns Domain 2: low Domain 3: low Domain 4: low Domain 5: some concerns
Poppitt, 2007	18	1.3g per 30g White bread and berry jam with BG supplement  1.3g per 30g Commercial sports drink supplemented with high glucose syrup and BG supplement	21.7% reduction (statistically significant, p<0.05)  6.4% reduction	No difference [note 4]  No difference [note 4]	21.7% reduction (statistically significant, p<0.05)  8.5% reduction	Overall RoB – high Domain 1: some concerns Domain S: some concerns Domain 2: some concerns Domain 3: high Domain 4: low Domain 5: some concerns
Regand, 2009	12	1.88g per 30g Oat crisp bread served with either 1 or 2 cups of	6.5% increase	1.36% reduction	Not reported	Overall RoB – some concerns Domain 1: some concerns Domain S: some concerns Domain 2: some concerns

Study (first author, year)	Number of participants	Dose of BG(g) per avCHO(g) and description of test meal [note 1]	% change in blood glucose iAUC vs comparator	% change in peak glucose vs comparator	% change in insulin iAUC vs comparator	Risk of bias [note 2]
		water, coffee or tea with 30mL 2% milk				Domain 3: low Domain 4: low Domain 5: some concerns
Rieder, 2019	14	0.9g per 30g Barley bread served with 250mL water	15.6% reduction	32% reduction	Not reported	Overall RoB – some concerns Domain 1: some concerns Domain S: some concerns Domain 2: some concerns Domain 3: low Domain 4: low Domain 5: some concerns
		1.9g per 30g Low OBC barley bread served with 250mL water	37% reduction (statistically significant, p<0.05)	14.29% reduction	Not reported	
Wolever, 2018	40	1.27g per 30g Instant oatmeal with 0g oat bran made up with 200ml water and served with 240mL 2% milk	5.8% reduction	10.7% reduction (statistically significant, p<0.05)	Not reported	Overall RoB – some concerns Domain 1: low Domain S: some concerns Domain 2: low Domain 3: low Domain 4: low Domain 5: low
		1.48g per 30g Instant oatmeal with 0.72g oat bran made up with 200ml water and served with 240mL	12.5% reduction	12.7% reduction (statistically significant, p<0.05)	Not reported	

Study (first author, year)	Number of participants	Dose of BG(g) per avCHO(g) and description of test meal [note 1]	% change in blood glucose iAUC vs comparator	% change in peak glucose vs comparator	% change in insulin iAUC vs comparator	Risk of bias [note 2]
		2% milk  1.70g per 30g Instant oatmeal with 1.43g oat bran made up with 200ml water and served with 240mL 2% milk	7.32% reduction	18% reduction (statistically significant, p<0.05)	Not reported	
Wolever, 2019	30	1.75g per 30g Instant oats made up with 240mL water, served with 218.5g lactose free, fat free milk and an additional drink of 1 or 2 cups of tea or coffee or water with 30mL 2% milk and non-energy sweetener if desired  1.69g per 30g Old fashioned oats made up with 240mL water,	5.1% increase  5.1% reduction	5.36% increase  16.1% reduction (statistically significant,	10.9% increase  3.0% reduction	Overall RoB – some concerns Domain 1: some concerns Domain S: some concerns Domain 2: low Domain 3: low Domain 4: low Domain 5: low

Study (first author, year)	Number of participants	Dose of BG(g) per avCHO(g) and description of test meal [note 1]	% change in blood glucose iAUC vs comparator	% change in peak glucose vs comparator	% change in insulin iAUC vs comparator	Risk of bias [note 2]
		<p>served with 218.5g lactose free, fat free milk and an additional drink of 1 or 2 cups of tea or coffee or water with 30mL 2% milk and non-energy sweetener if desired</p> <p>1.71g per 30g Steel cut oats made up with 240mL water, served with 218.5g lactose free, fat free milk and an additional drink of 1 or 2 cups of tea or coffee or water with 30mL 2% milk and non-energy sweetener if desired</p> <p>0.89g per 30g 'Honey Nut</p>	<p>30.1% reduction (statistically significant, p&lt;0.05)</p> <p>3.1% increase</p>	<p>p&lt;0.05)</p> <p>26.1% reduction (statistically significant, p&lt;0.05)</p> <p>4.6% reduction</p>	<p>16.8% reduction (statistically significant, p&lt;0.05)</p> <p>1% increase</p>	

Study (first author, year)	Number of participants	Dose of BG(g) per avCHO(g) and description of test meal [note 1]	% change in blood glucose iAUC vs comparator	% change in peak glucose vs comparator	% change in insulin iAUC vs comparator	Risk of bias [note 2]
		Cheerios' with 218.5g lactose free, fat free milk, served with 240mL water and an additional drink of 1 or 2 cups of tea or coffee or water with 30mL 2% milk and non-energy sweetener if desired				
Wolever, 2020	28	1.17g per 30g Instant oatmeal with 3g oat bran made up with 200mL water served with skimmed milk, bread, butter and jam	23% reduction	21.3% reduction (statistically significant, p<0.05)	18.7% reduction	Overall RoB – high Domain 1: some concerns Domain S: some concerns Domain 2: some concerns Domain 3: high Domain 4: low Domain 5: low
Zhu, 2019	10	1.86g per 30g Pearled oats cooked under normal pressure	38.4% reduction (statistically significant, p<0.05)	37.1% reduction	Not reported	Overall RoB – some concerns Domain 1: some concerns Domain S: some concerns Domain 2: low Domain 3: low



Study (first author, year)	Number of participants	Dose of BG(g) per avCHO(g) and description of test meal [note 1]	% change in blood glucose iAUC vs comparator	% change in peak glucose vs comparator	% change in insulin iAUC vs comparator	Risk of bias [note 2]
		1.86g per 30g Pearled oats cooked under high pressure	31.9% reduction (statistically significant, p<0.05)	37.1% reduction	Not reported	Domain 4: low Domain 5: some concerns
		1.1g per 30g Whole grain oats cooked under normal pressure and cooked rice	31.0% reduction	22.9% reduction	Not reported	
		1.1g per 30g Whole grain oats cooked under higher pressure and cooked rice	22.9% reduction	11.4% reduction	Not reported	
		0.96g per 30g Pearled oats cooked under normal pressure and cooked rice	23.4% reduction	17.1% reduction	Not reported	
		0.96g per 30g Pearled oats	16.9% reduction	14.3% reduction	Not reported	

Study (first author, year)	Number of participants	Dose of BG(g) per avCHO(g) and description of test meal [note 1]	% change in blood glucose iAUC vs comparator	% change in peak glucose vs comparator	% change in insulin iAUC vs comparator	Risk of bias [note 2]
		cooked under higher pressure and cooked rice				
Cavallero, 2002	8	1.19g per 30g Whole grain barley bread served with 500mL water	0.78% reduction	Not reported	Not reported	Overall RoB – some concerns Domain 1: some concerns Domain S: some concerns Domain 2: low Domain 3: low Domain 4: low Domain 5: some concerns
Chillo, 2011 (series 1)	9	0.9g per 30g Semolina pasta with 2% added GG served with 200mL water	8.7% reduction	Not reported	Not reported	Overall RoB – some concerns Domain 1: some concerns Domain S: some concerns Domain 2: low Domain 3: low Domain 4: low Domain 5: some concerns
		1.6g per 30g Semolina pasta with 4% added GG served with 200mL water	4.6% reduction	Not reported	Not reported	
Chillo, 2011 (series 2)	9	0.9g per 30g Semolina pasta with 2% added BB served with 200mL water	19.3% reduction	Not reported	Not reported	Overall RoB – some concerns Domain 1: some concerns Domain S: some concerns Domain 2: low Domain 3: low

Study (first author, year)	Number of participants	Dose of BG(g) per avCHO(g) and description of test meal [note 1]	% change in blood glucose iAUC vs comparator	% change in peak glucose vs comparator	% change in insulin iAUC vs comparator	Risk of bias [note 2]
		1.6g per 30g Semolina pasta with 4% added BB served with 200mL water	25.7% reduction	Not reported	Not reported	Domain 4: low Domain 5: some concerns
Östman, 2006	10	1.07g per 30g 50% CB bread served with 10g butter, 12g cheese, 200mL water and 150mL tea, coffee or water	"At 120 min the 50% CB bread gave a significantly higher blood glucose response than the WWB" [note 4]	Not reported	Not reported	Overall RoB – high Domain 1: some concerns Domain S: some concerns Domain 2: some concerns Domain 3: low Domain 4: low Domain 5: high
Thondre, 2009	8	1.2g per 30g Whole wheat chapati with 2g added BB served with 200mL water	1.4% reduction	Not reported	Not reported	Overall RoB – some concerns Domain 1: some concerns Domain S: some concerns Domain 2: low Domain 3: low Domain 4: low Domain 5: some concerns
Paquin, 2013	14	0.94g per 30g Fruit juice with added oatwell (OBC)	31.4% reduction	22.7% reduction (statistically significant,	6.8% reduction	Overall RoB – some concerns Domain 1: some concerns Domain S: some concerns Domain 2: some concerns

<b>Study (first author, year)</b>	<b>Number of participants</b>	<b>Dose of BG(g) per avCHO(g) and description of test meal [note 1]</b>	<b>% change in blood glucose iAUC vs comparator</b>	<b>% change in peak glucose vs comparator</b>	<b>% change in insulin iAUC vs comparator</b>	<b>Risk of bias [note 2]</b>
				p<0.05)		Domain 3: low Domain 4: low Domain 5: some concerns

[note 1] dose based on extrapolation of avCHO study dose to 30

[note 2] domains as presented in Cochrane RoB2 tool for crossover trials

[note 3] values included are versus a different comparator to what was presented by the applicant as the committee felt this was more appropriate

[note 4] numerical values not reported