

**Supplementary Information:** Effect of Adding Oat Bran to Instant Oatmeal on Glycaemic Response in Humans – a Study to Establish the Minimum Effective Dose of Oat  $\beta$ -glucan.

**Details of participants' use of supplements and allowed prescription drugs:**

Twenty-five subjects took no prescription medications or supplements, 8 subjects took vitamin and/or mineral supplements, and 2 of these and 7 others were on the following daily medications: doxycycline 100mg daily for acne (n=1); amphetamine / dextroamphetamine 20 mg for attention deficit hyperactivity disorder and an oral contraceptive (n=1); citalopram 20mg daily for depression (n=1); venlafaxine 300mg daily for depression (n=1); an oral contraceptive (n=2); fluoxetine 20mg daily for anxiety (n=1); 20mg rivaroxaban (n=1); and mometasone furoate by inhalation 50 $\mu$ g twice daily (n=1).

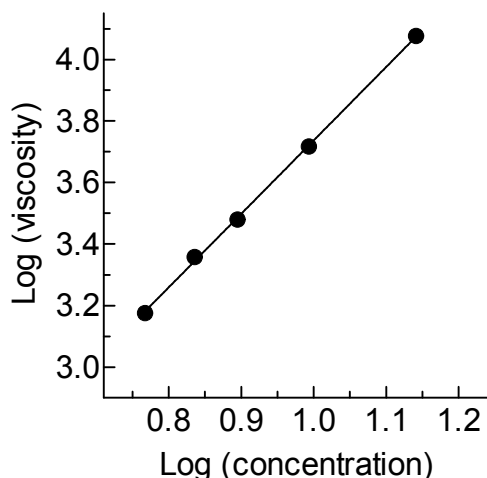
**Description of minor protocol violation:**

For 1 subject, the sample 45 min after IO+0.8, was obtained 10 min late; no correction was made because the measured value, 5.61, was higher than the value imputed from the other 239 glucose values at 45min, 4.36.

**Missing values:**

Glucose could not be measured in 1 of 1920 samples (0.05%) due to clotted blood; the missing value at -5 min was replaced by the 0 min value. One -5 min glucose concentration, 3.46 mmol/L, (0.84 below the corresponding 0 min value of 4.30, and 4.3 $\times$ SD below the mean of the 5 other -5 min values for the same subject) was considered to be an analytical error and replaced by the 0 min value.

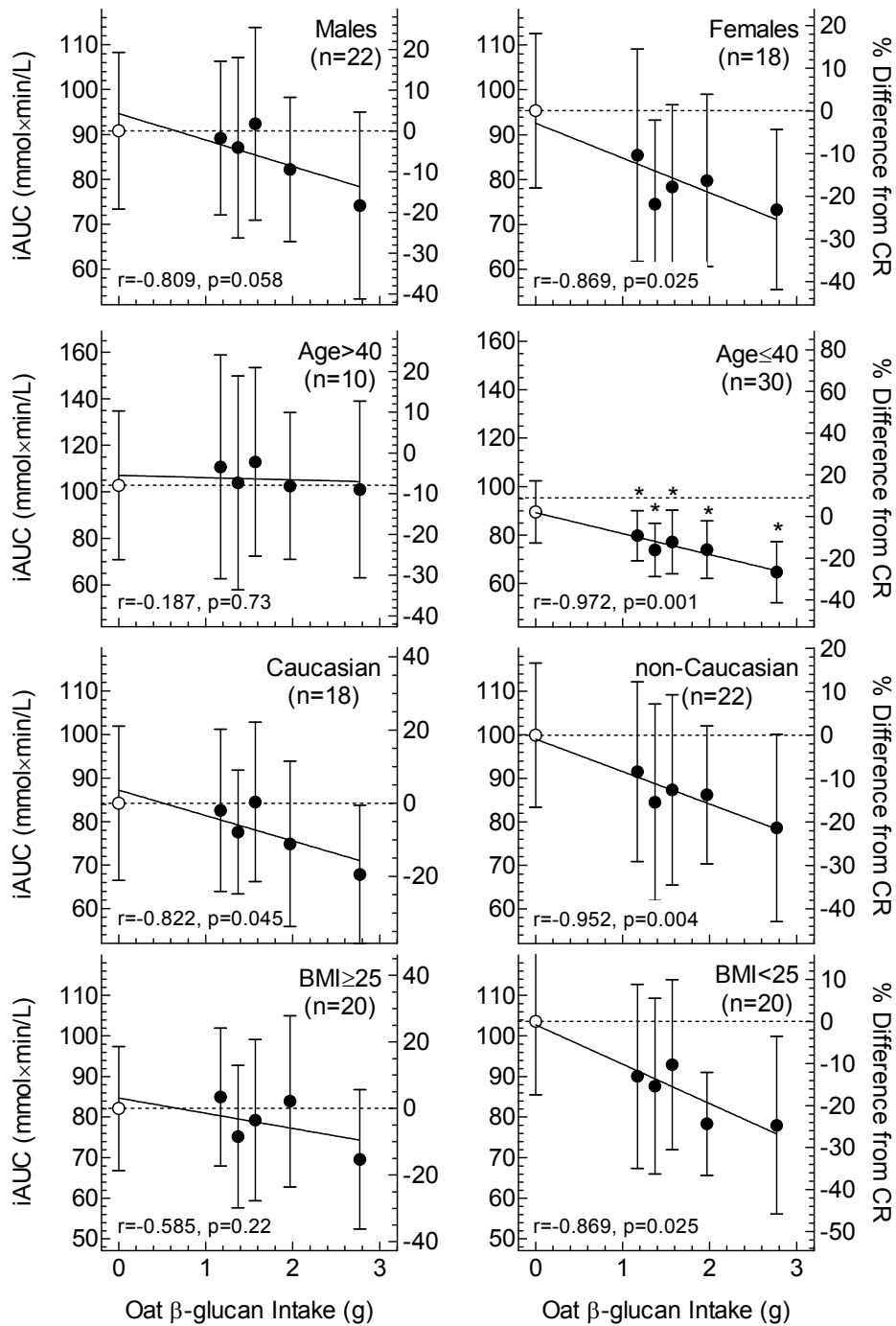
**Supplementary Figure 1:** Relationship between test meal viscosity and content of oat  $\beta$ -glucan.



Values are means; line is the linear regression line as follows ( $r^2=0.9995$ ):  $y = 1.35 + 2.39x$ .

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**Supplementary Figure 2:** Effect of sex, age, ethnicity and BMI on glucose iAUC.



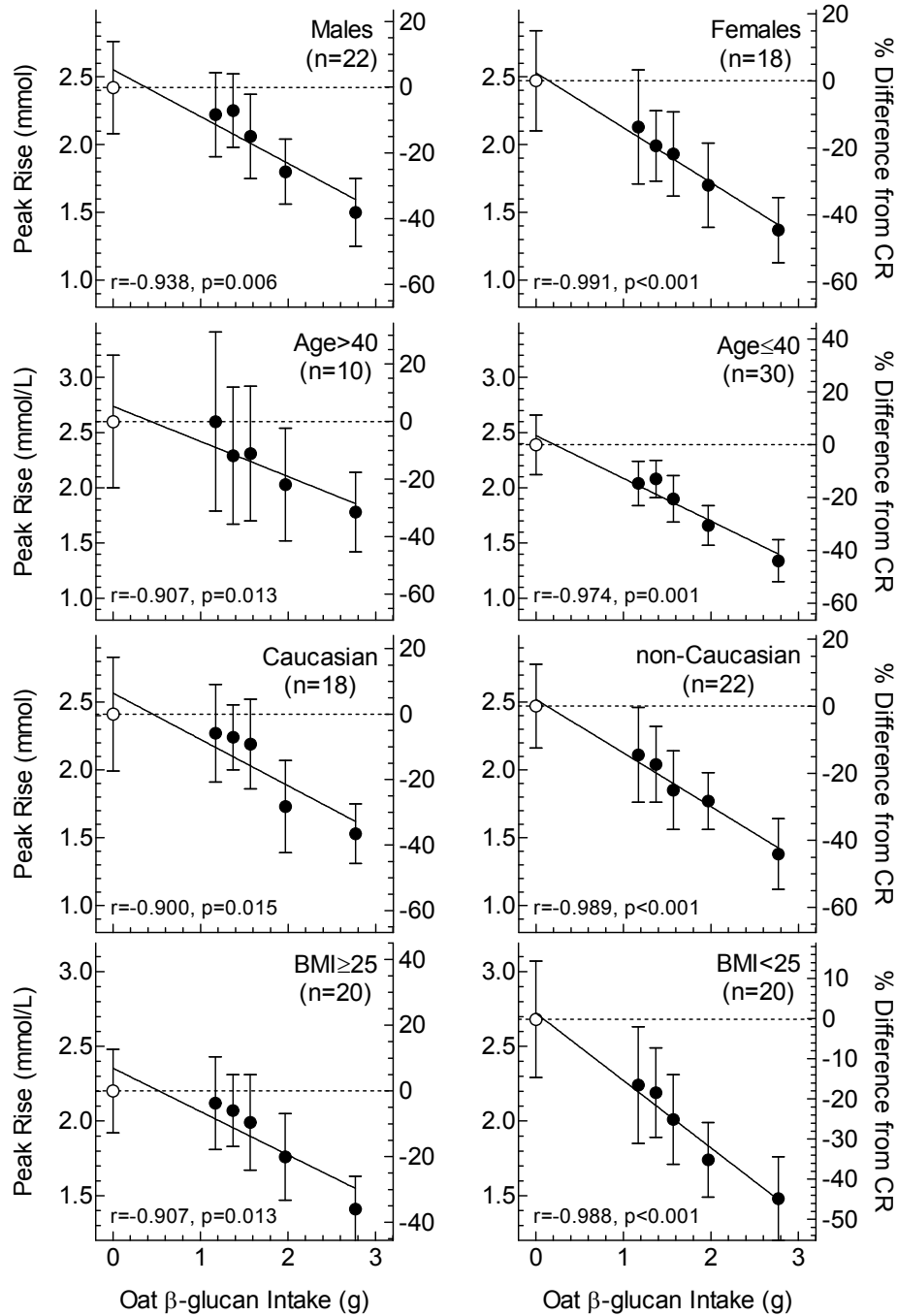
Relationships between test-meal  $\beta$ -glucan content and incremental area under the glucose curve (iAUC) by sex, age, ethnicity and BMI. The left y-axes are absolute values and the right y-axes % difference

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from control (Cream of Rice). Values are means and 95% confidence intervals and solid lines are regressions. Filled circles are for the oat test meals; the open circles are for cream of rice.

\* Significant difference from subjects aged >40 y by unpaired t-test ( $p < 0.05$ ).

**Supplementary Figure 3:** Effect of sex, age, ethnicity and BMI on glucose peak rise.



Relationships between test-meal  $\beta$ -glucan content and peak rise of blood glucose by sex, age, ethnicity and BMI. The left y-axes are absolute values and the right y-axes % difference from control (Cream of

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Rice). Values are means and 95% confidence intervals and solid lines are regressions. Filled circles are for the oat test meals; the open circles are for cream of rice.

Supplementary Table 1: Adjustment factors for the effect on glucose iAUC of the protein, fat and available carbohydrate (avCHO) in oat bran added to instant oatmeal.

Test-Meal*	Pro (g)	Fat (g)	avCHO (g)	Diff (g)		Adjustment Factor <sup>a</sup>			avCHO		PFCa <sup>d</sup>
				Pro	Fat	Pa	Fa	PFa	RGR <sup>b</sup>	Ca <sup>c</sup>	
IO	11.8	6.8	27.6	0	0	1	1	1	0.458	1	1
IO+0.72gOB	12.0	6.8	27.7	0.2	0	0.997	1.000	0.997	0.459	1.003	1.000
IO+1.43gOB	12.1	6.9	27.7	0.3	0.1	0.996	1.000	0.996	0.459	1.003	0.998
IO+2.86g OB	12.5	6.9	27.9	0.7	0.1	0.991	1.000	0.991	0.462	1.008	0.998
IO5.72gOB	13.1	7.1	28.1	1.3	0.3	0.983	0.999	0.982	0.464	1.013	0.995

iAUC = incremental area under the curve; Pro = protein; Diff = difference from IO.

\* IO = Instant Oatmeal; OB = oat bran . 2% milk consumed with every test-meal.

<sup>a</sup> Adjustment factors indicate the extent to which the additional protein and fat in the test meals, relative to IO, influence iAUC relative to IO. There is a linear dose-response for the effect of protein and fat on iAUC whereby protein and fat reduce iAUC by 1.27%/g and 0.45%/g, respectively<sup>1</sup>. The adjustment factors for protein (Pa) and fat (Fa) are obtained by multiplying these values by the difference in protein and fat, dividing by 100 and subtracting from 1. The adjustment factor for the combined effect of protein and fat, PFCa = Pa × Fa.

<sup>b</sup> RGR is calculated as  $1 - e^{-0.0222g}$  where g = grams of available carbohydrate in the test meal<sup>2</sup>.

<sup>c</sup> The adjustment factor for carbohydrate, Ca = RGRx/RGRio where RGRx is the RGR for the each test meal and RGRio is the RGR for IO.

<sup>d</sup> The adjustment factor for the combined effect of protein, fat and carbohydrate, PFCa = Pa × Fa × Ca.

<sup>1</sup> E. Moghaddam, J. A. Vogt and T. M. S. Wolever, The effects of fat and protein on glycemic responses in nondiabetic humans vary with waist circumference, fasting plasma insulin and dietary fiber intake. *J. Nutr.* 2006, **136**, 2506-2511.

<sup>2</sup> T. M. S. Wolever, *The Glycaemic Index: A Physiological Classification of Dietary Carbohydrate*. CABI Publishing, Wallingford, UK, 2006, page 66.

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Supplementary Table 2: Adjustment factors for the effect on glucose peak rise of the protein and fat in oat bran added to instant oatmeal.

Test-Meal*	Pro (g)	Fat (g)	Diff (g)		Adjustment Factor <sup>a</sup>		
			Pro	Fat	Pa	Fa	PFa
IO	11.8	6.8	0	0	1	1	1
IO+0.72gOB	12.0	6.8	0.2	0	0.998	1.000	0.998
IO+1.43gOB	12.1	6.9	0.3	0.1	0.996	0.999	0.996
IO+2.86g OB	12.5	6.9	0.7	0.1	0.991	0.999	0.991
IO5.72gOB	13.1	7.1	1.3	0.3	0.984	0.998	0.982

iAUC = incremental area under the curve; Pro = protein; Diff = difference from IO.

\* IO = Instant Oatmeal; OB = oat bran . 2% milk consumed with every test-meal.

<sup>a</sup> Adjustment factors indicate the extent to which the additional protein and fat in the test meals, relative to IO, influence glucose peak rise relative to IO. There is a linear dose-response for the effect of protein and fat on peak rise whereby protein and fat reduce iAUC by 1.22%/g and 0.62%/g, respectively<sup>3</sup>. The adjustment factors for protein (Pa) and fat (Fa) are obtained by multiplying these values by the difference in protein and fat, dividing by 100 and subtracting from 1. The adjustment factor for the combined effect of protein and fat, PFa = Pa  $\times$  Fa.

Supplementary Table 3: Glucose iAUC (incremental area under the curve) and peak rise (PR) adjusted for the effect of the protein, fat and available carbohydrate (avCHO) in oat bran added to instant oatmeal.

Test-Meal*	iAUC PFa	iAUC PFCa	iAUC <sup>a</sup>	iAUC <sub>PF</sub> <sup>a</sup>	iAUC <sub>PFC</sub> <sup>a</sup>	PR PFa	PR	PR <sub>PF</sub>
IO	1	1	87.5	87.5	87.5	1	2.18	2.18
IO+0.72gOB	0.997	1.000	81.4	81.6	81.4	0.998	2.13	2.14
IO+1.43gOB	0.996	0.998	86.1	86.4	86.2	0.996	2.00	2.01
IO+2.86g OB	0.991	0.998	81.1	81.9	81.2	0.991	1.75	1.77
IO5.72gOB	0.982	0.995	73.8	75.1	74.1	0.982	1.45	1.47

iAUC PFa and PFCa are the adjustment factors for iAUC taken from Supplementary Table 2. PR Pfa is the adjustment factor peak rise taken from Supplementary Table 3.

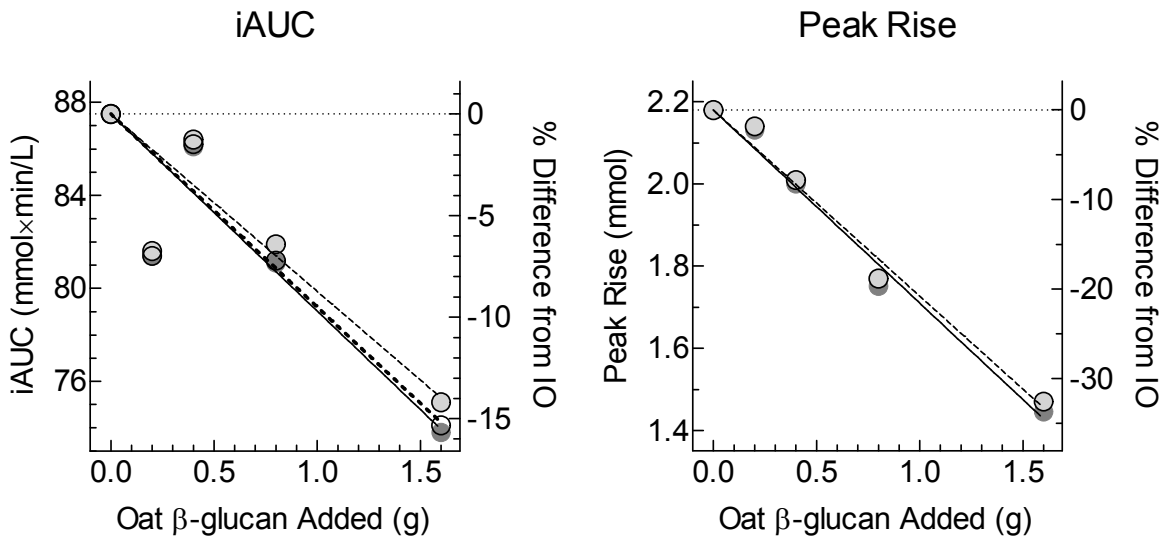
<sup>a</sup> iAUC adjusted for the effect of protein and fat,  $iAUC_{PF} = iAUC / (iAUC \text{ PFa})$  and iAUC adjusted for the effects of protein, fat and carbohydrate,  $iAUC_{PFC} = iAUC / (iAUC \text{ PFCa})$

<sup>b</sup> PR adjusted for the effect of protein and fat,  $PR_{PF} = PR / (PR \text{ PFa})$

<sup>3</sup> E. Moghaddam, J. A. Vogt and T. M. S. Wolever, The effects of fat and protein on glycemic responses in nondiabetic humans vary with waist circumference, fasting plasma insulin and dietary fiber intake. *J. Nutr.* 2006, **136**, 2506-2511.

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**Supplementary Figure 4:** Estimated effect of the protein, fat and carbohydrate in the oat bran added to instant oatmeal on iAUC (incremental area under the curve for glucose) and glucose peak rise.



Dark grey circles (solid lines) are the mean iAUC and peak rises elicited by instant oatmeal alone (0g oat  $\beta$ -glucan added) and instant oatmeal to which was added various amounts of oat  $\beta$ -glucan from oat bran. Light grey circles (dashed lines) illustrate what the values would be like after subtracting the estimated impact of the protein and fat in the oat bran (see Supplementary Table 4). Open circles (thick dotted line, only for iAUC) show the estimated effect of accounting for the protein, fat and available carbohydrate in oat bran. Lines are the regression lines forced through the mean for instant oatmeal alone.