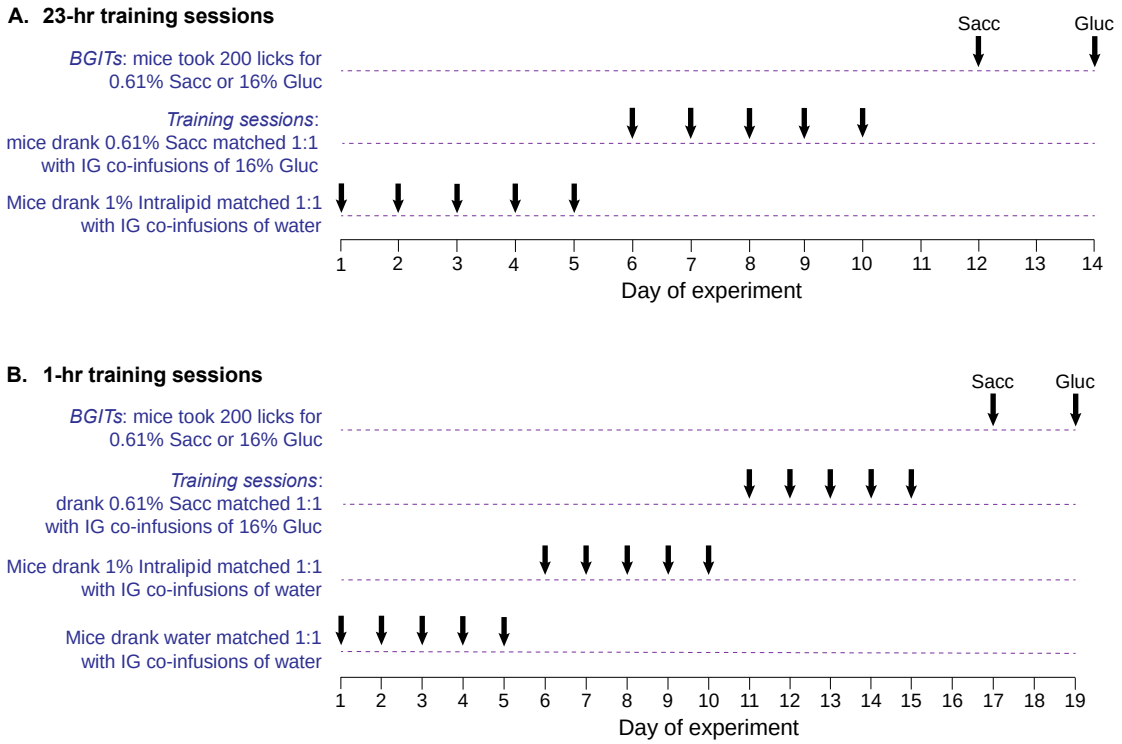


Figure S1. Timeline of the experimental interventions in Experiment 1. The interventions occurred during daily 23-hr (A) or 1-hr (B) training sessions.

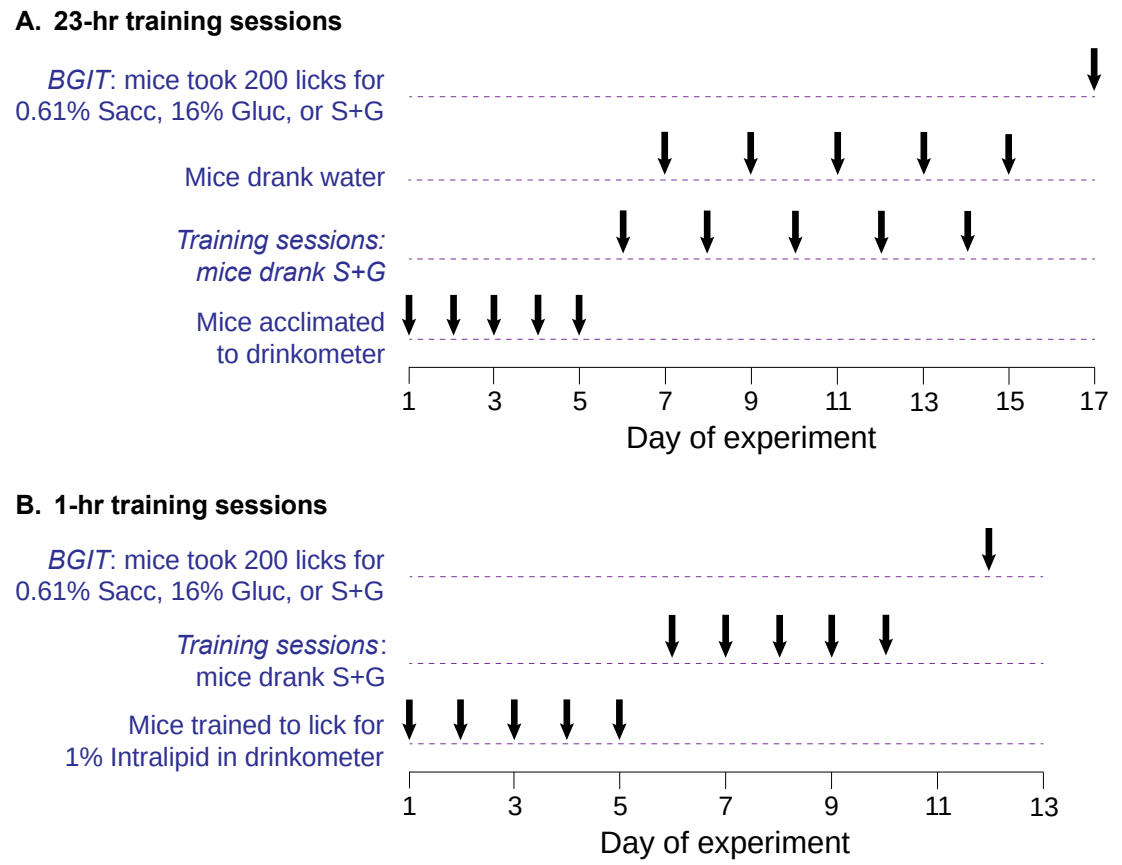
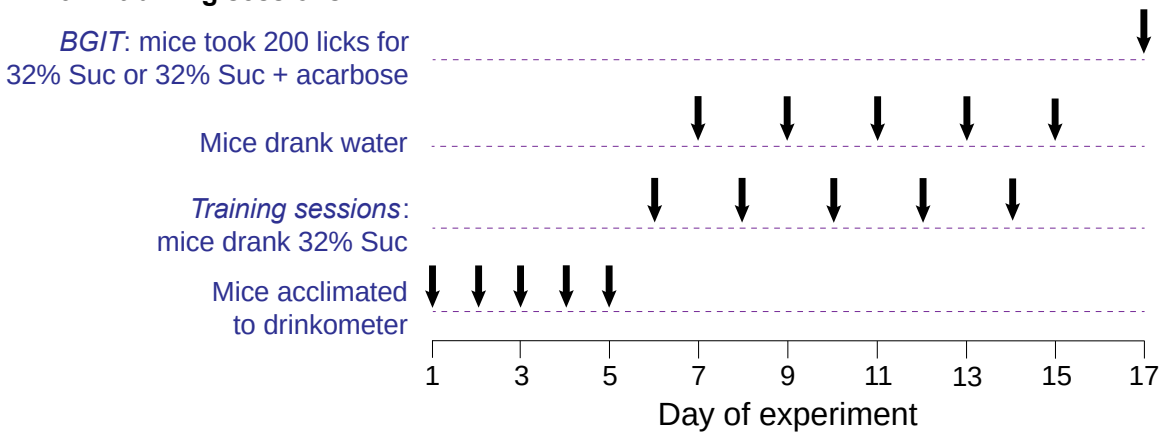


Figure S2. Timeline of the experimental interventions in Experiment 2. The interventions occurred during daily 23-hr (A) or 1-hr (B) training sessions.

A. 23-hr training sessions



B. 1-hr training sessions

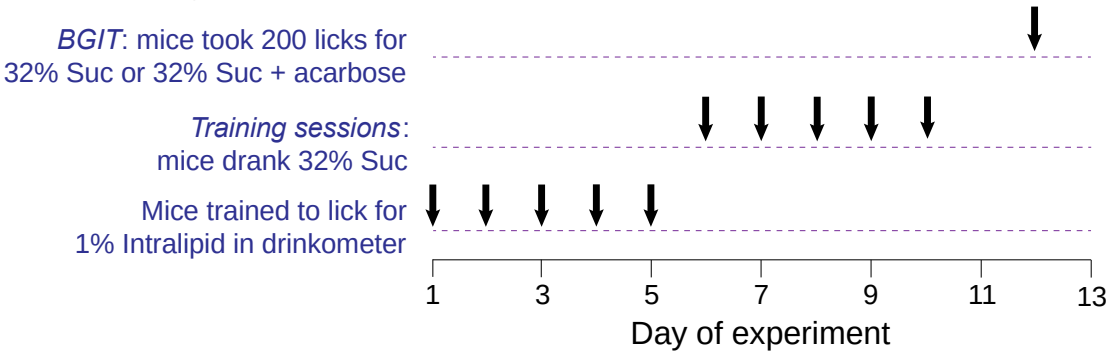


Figure S3. Timeline of the experimental interventions in Experiment 3. The interventions occurred during daily 23-hr (A) or 1-hr (B) training sessions.

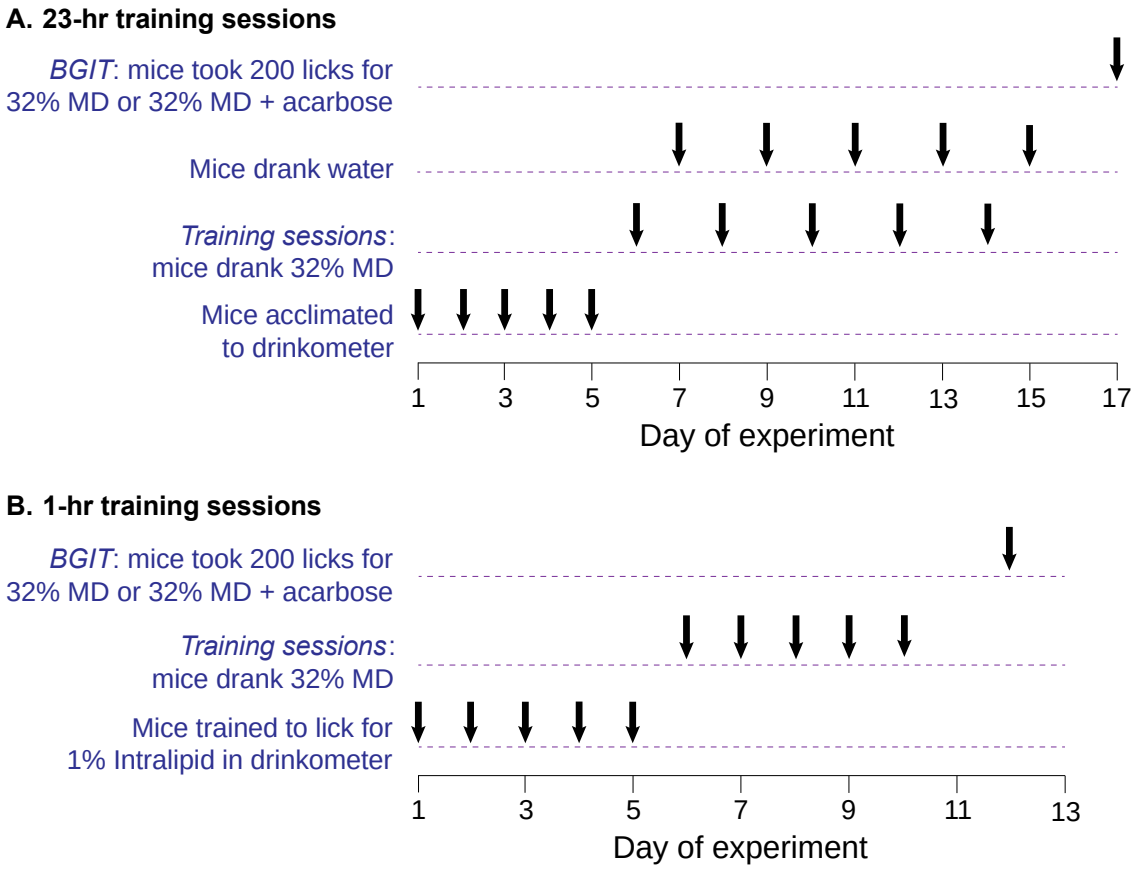


Figure S4. Timeline of the experimental interventions in Experiment 4. The interventions occurred during daily 23-hr (A) or 1-hr (B) training sessions.

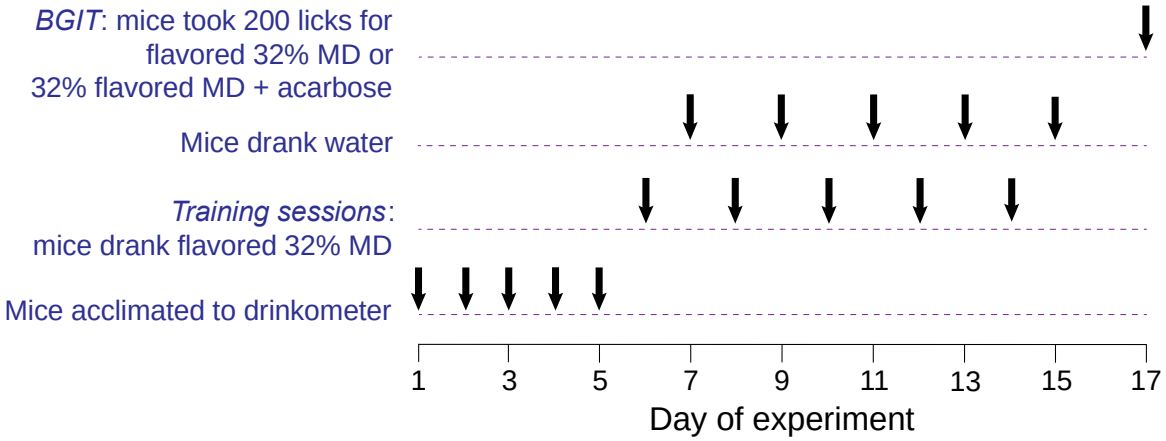


Figure S5. Timeline of the experimental interventions in Experiment 5. The interventions occurred during daily 23-hr training sessions.

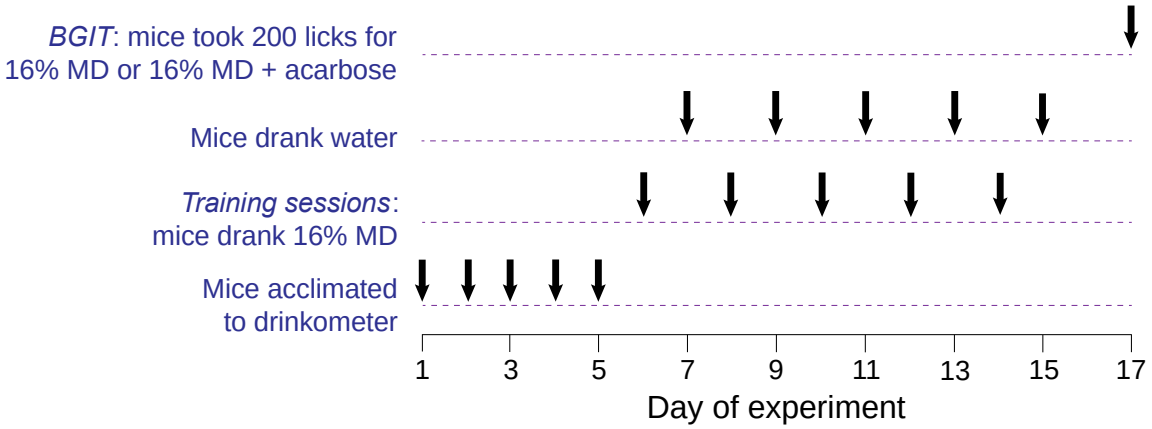


Figure S6. Timeline of the experimental interventions in Experiment 6. The interventions occurred during daily 23-hr training sessions.

Table S1. Analysis of the results in Fig. 1.

Dependent measure	Training session duration	Source of variation	df	F-ratio	P-value
Plasma insulin levels across BGIT	23-hr	Test solutions	1, 4	16.9	0.015
		Time across BGIT	1.2, 4.6	8.0	0.038
		Interaction	1.4, 5.4	8.0	0.029
	1-hr	Test solutions	1, 7	2.2	0.18
		Time across BGIT	2.2, 15.5	10.6	0.001
		Interaction	1.7, 12.0	8.5	0.007
Blood glucose levels across BGIT	23-hr	Test solutions	1, 4	19.1	0.012
		Time across BGIT	1.8, 7.4	12.7	0.004
		Interaction	2.0, 8.0	9.6	0.007
	1-hr	Test solutions	1, 7	140.3	< 0.0001
		Time across BGIT	3.1, 22.0	55.6	< 0.0001
		Interaction	2.7, 18.8	37.9	< 0.0001

Prior to the BGITs, the mice were subjected to 23-hr or 1-hr training sessions, during which consumption of 0.61% Sacc was paired with IG co-infusions of 16% Gluc. Afterwards, all mice were run through two 60-min BGITs, one with 0.61% Sacc and the other with 16% Gluc. Plasma insulin and blood glucose levels were measured at 5 time-points across the BGIT. Each dependent measure was analyzed with a mixed-model ANOVA. The degrees of freedom were subjected to a Geisser-Greenhouse correction.

Table S2. Analysis of the results in Fig. 2.

Dependent measure	Training sessions	Source of variation	df	F-ratio	P-value
Intake during the training sessions	23-hr	Test solutions	2, 21	0.2	0.78
		Training sessions	1.8, 37.2	4.8	0.018
		Interaction	8, 84	1.9	0.066
	1-hr	Test solutions	2, 24	0.2	0.78
		Training sessions	2.3, 56.2	19.5	<0.0001
		Interaction	8, 96	1.4	0.19
Plasma insulin levels across the BGIT	23-hr	Test solutions	2, 20	8.8	0.0018
		Time across BGIT	3.3, 66.6	16.4	< 0.0001
		Interaction	8, 80	4.7	0.0001
	1-hr	Test solutions	2, 24	5.4	0.012
		Time across BGIT	2.5, 60.4	20.6	< 0.0001
		Interaction	8, 96	7.4	< 0.0001
	None	Test solutions	2, 22	18.8	< 0.0001
		Time across BGIT	2.9, 63.0	41.8	< 0.0001
		Interaction	8, 88	14.9	< 0.0001
Blood glucose levels across the BGIT	23-hr	Test solutions	2, 20	25.0	< 0.0001
		Time across BGIT	2.4.47.4	63.2	< 0.0001
		Interaction	8, 80	12.2	< 0.0001
	1-hr	Test solutions	2, 24	41.6	< 0.0001
		Time across BGIT	2.2, 52.5	48.8	< 0.0001
		Interaction	8, 96	12.1	< 0.0001
	None	Test solutions	2, 22	16.5	< 0.0001
		Time across BGIT	2.6, 57.1	51.9	< 0.0001
		Interaction	8, 88	11.7	< 0.0001

Prior to the BGIT, the experimental mice were subjected to 23-hr, 1-hr or no training sessions with the S+G solution (i.e., 0.61% Sacc + 16% Gluc). Subsequently, all mice were run through a 60-min BGIT with one of three test solutions: 0.61% Sacc, 16% Gluc, or S+G. Plasma insulin and blood glucose levels were measured at 5 time-points across the BGIT. Each dependent measure was analyzed with a mixed-model ANOVA. The degrees of freedom were subjected to a Geisser-Greenhouse correction.

Table S3. Analysis of the results in Fig 3.

Dependent measure	Training sessions	Source of variation	df	F-ratio	P-value
Intake during the training sessions	23-hr	Test solutions	1, 18	0.1	0.71
		Training sessions	2, 36	3.3	0.049
		Interaction	4, 72	0.5	0.71
	1-hr	Test solutions	1, 14	< 0.1	0.87
		Training sessions	2.9, 41.0	13.4	< 0.0001
		Interaction	4, 56	0.5	0.71
Plasma insulin levels across the BGIT	23-hr	Test solutions	1, 18	12.8	0.002
		Time across BGIT	2.6, 45.9	11.2	< 0.0001
		Interaction	4, 72	12.6	< 0.0001
	1-hr	Test solutions	1, 14	47.1	< 0.0001
		Time across BGIT	2.7, 37.2	21.4	< 0.0001
		Interaction	4, 56	9.7	< 0.0001
	None	Test solutions	1, 14	13.3	0.003
		Time across BGIT	1.8, 25.7	9.0	0.001
		Interaction	4, 56	10.8	< 0.0001
Blood glucose levels across the BGIT	23-hr	Test solutions	1, 18	18.7	0.0004
		Time across BGIT	2.8, 49.6	45.8	< 0.0001
		Interaction	4, 72	14.7	< 0.0001
	1-hr	Test solutions	1, 14	25.7	0.0002
		Time across BGIT	1.5, 20.7	37.3	< 0.0001
		Interaction	4, 56	27.2	< 0.0001
	None	Test solutions	1, 14	43.4	< 0.0001
		Time across BGIT	1.4, 19.2	21.8	< 0.0001
		Interaction	4, 56	13.7	< 0.0001

Prior to the BGIT, the experimental mice were subjected to 23-hr, 1-hr or no training sessions with 32% Suc. Subsequently, all mice were run through a 60-min BGIT with one of two test solutions: 32% Suc + acarbose or 32% Suc. Plasma insulin and blood glucose levels were measured at 5 time-points across the BGIT. Each dependent measure was analyzed with a mixed-model ANOVA. The degrees of freedom were subjected to a Geisser-Greenhouse correction.

Table S4. Analysis of the results in Fig 4.

Dependent measure	Training sessions	Source of variation	df	F-ratio	P-value
Intake during the training sessions	23-hr	Test solutions	1, 15	0.4	0.53
		Training sessions	2.8, 41.3	2.5	0.079
		Interaction	4, 60	2.1	0.091
	1-hr	Test solutions	1, 17	0.5	0.49
		Training sessions	2.5, 43.0	3.6	0.027
		Interaction	4, 68	0.3	0.86
Plasma insulin levels across the BGIT	23-hr	Test solutions	1, 15	3.7	0.075
		Time across BGIT	2.9, 43.1	20.7	< 0.001
		Interaction	4, 60	4.2	0.004
	1-hr	Test solutions	1, 28	4.8	< 0.001
		Time across BGIT	3.0, 82.6	36.2	< 0.001
		Interaction	4, 112	22.6	< 0.001
	None	Test solutions	1, 15	15.9	< 0.002
		Time across BGIT	2.5, 38.4	54.8	< 0.0001
		Interaction	4, 60	40.6	< 0.0001
Blood glucose levels across the BGIT	23-hr	Test solutions	1, 15	14.6	0.002
		Time across BGIT	2.4, 35.8	37.2	< 0.001
		Interaction	4, 60	4.5	0.003
	1-hr	Test solutions	1, 28	38.2	< 0.001
		Time across BGIT	2.6, 73	54.4	< 0.001
		Interaction	4, 112	23.2	< 0.001
	None	Test solutions	1, 14	29.3	< 0.001
		Time across BGIT	2.5, 34.6	55.6	< 0.001
		Interaction	4, 56	17.7	< 0.001

Prior to the BGIT, the experimental mice were subjected to 23-hr, 1-hr, or no training sessions with 32% MD. Afterwards, all mice were run through a 60-min BGIT with one of two test solutions: 32% MD + acarbose or 32% MD. Plasma insulin and blood glucose levels were measured at 5 time-points across the BGIT. Each dependent measure was analyzed with a mixed-model ANOVA. The degrees of freedom were subjected to a Geisser-Greenhouse correction.

Table S5. Analysis of the results in Fig. 5.

Dependent measure	Source of variation	df	F-ratio	P-value
Intake during the training sessions	Test solutions	1, 17	< 0.1	0.86
	Training sessions	3.0, 51.4	8.0	0.0002
	Interaction	4, 68	1.1	0.38
Plasma insulin levels across the BGIT	Test solutions	1, 17	11.7	0.003
	Time across BGIT	2.5, 42.8	39.2	<0.0001
	Interaction	4, 68	21.7	<0.0001
Blood glucose levels across the BGIT	Test solutions	1, 17	31.3	< 0.0001
	Time across BGIT	2.3, 39.6	30.5	< 0.0001
	Interaction	4, 68	6.7	0.0001

Prior to the BGIT, the mice were subjected to 23-hr training sessions with flavored 32% MD. Subsequently, all mice were run through a 60-min BGIT with one of two test solutions: flavored 32% MD + acarbose or flavored 32% MD. Plasma insulin and blood glucose levels were measured at 5 time-points across the BGIT. Each dependent measure was analyzed with a mixed-model ANOVA. The degrees of freedom were subjected to a Geisser-Greenhouse correction.

Table S6. Analysis of the results in Fig. 6.

Dependent measure	Training sessions	Source of variation	df	F-ratio	P-value
Plasma insulin levels across BGIT	23-hr	Test solutions	1, 14	8.2	< 0.013
		Time across BGIT	2.4, 33.2	9.4	< 0.0004
		Interaction	4, 56	7.5	< 0.0001
	None	Test solutions	1, 14	8.9	< 0.01
		Time across BGIT	2.2, 31.3	5.9	< 0.006
		Interaction	4, 56	11.7	< 0.0001
Blood glucose levels across BGIT	23-hr	Test solutions	1, 14	41.0	< 0.0001
		Time across BGIT	2.9, 40.4	38.3	< 0.0001
		Interaction	4, 56	13.1	< 0.0001
	None	Test solutions	1, 14	33.8	< 0.0001
		Time across BGIT	3.1, 43.8	31.6	< 0.0001
		Interaction	4, 56	19.2	< 0.0001

Prior to the BGIT, the experimental mice were subjected to 23-hr or no training sessions with 16% MD. Subsequently, all mice were run through a 60-min BGIT with one of two test solutions: 16% MD + acarbose or 16% MD. Plasma insulin and blood glucose levels were measured at 5 time-points across the BGIT. Each dependent measure was analyzed with a mixed-model ANOVA. The degrees of freedom were subjected to a Geisser-Greenhouse correction.