

**Table S1:** Adjusted outcome ratios with and without BMI adjustment according to sugar-sweetened and artificially sweetened beverage consumption among participants, FEPOS 2017-2019

	<b>Sugar-sweetened beverage consumption</b>	<b>Sugar-sweetened beverage consumption</b>	<b>Artificially sweetened beverage consumption</b>	<b>Artificially sweetened beverage consumption</b>
	Adjusted ratio and 95% CI <sup>a,b</sup>	Adjusted ratio and 95% CI <sup>a,c</sup>	Adjusted ratio and 95% CI <sup>a,b</sup>	Adjusted ratio and 95% CI <sup>a,c</sup>
<b>Semen parameters</b>				
Semen volume <sup>d</sup>	0.98 (0.91, 1.07)	0.98 (0.90, 1.07)	1.04 (0.93, 1.17)	1.04 (0.93, 1.18)
Sperm concentration	1.02 (0.89, 1.17)	1.02 (0.89, 1.17)	0.97 (0.81, 1.16)	0.97 (0.81, 1.15)
Total motility <sup>e</sup>	0.98 (0.95, 1.02)	0.98 (0.95, 1.02)	1.01 (0.98, 1.05)	1.01 (0.98, 1.05)
Sperm morphology (% normal sperm)	1.02 (0.91, 1.15)	0.99 (0.88, 1.13)	0.89 (0.76, 1.04)	0.88 (0.76, 1.03)
Total sperm count <sup>d</sup>	0.98 (0.84, 1.14)	0.98 (0.84, 1.14)	0.99 (0.81, 1.21)	1.00 (0.82, 1.23)

<sup>a</sup>Ratio between the semen quality characteristics for moderate consumption (≥3 days per week) relative to infrequent consumption (<3 days per week)

<sup>b</sup>Adjusted for candy intake, cake intake, energy drink consumption, coffee consumption, smoking, maternal smoking, maternal BMI, parental socio-economic status, abstinence time and fever

<sup>c</sup>Adjusted for BMI, candy intake, cake intake, energy drink consumption, coffee consumption, smoking, maternal smoking, maternal BMI, parental socio-economic status, abstinence time and fever

<sup>d</sup>Participants with recording of spillage excluded from analyses on semen volume and total sperm count (mill.)

<sup>e</sup>Analyses on total motility (A + B %) additionally adjusted for time to analysis

**Table S2:** Adjusted outcome ratios including unhealthy diet according to sugar-sweetened beverage consumption among participants, FEPOS 2017-2019

Semen parameters	Sugar-sweetened beverage consumption
	Adjusted ratio and 95% CI <sup>a,b</sup>
Semen volume <sup>c</sup>	1.00 (0.93, 1.08)
Sperm concentration	1.00 (0.88, 1.13)
Total motility <sup>d</sup>	0.98 (0.96, 1.01)
Sperm morphology (% normal sperm)	1.00 (0.90, 1.11)
Total sperm count <sup>c</sup>	0.96 (0.84, 1.01)

<sup>a</sup>Ratio between the semen quality characteristics for moderate consumption (≥3 days per week) relative to infrequent consumption (<3 days per week)

<sup>b</sup>Adjusted for unhealthy diet, energy drink consumption, coffee consumption, smoking, maternal smoking, maternal BMI, parental socio-economic status, abstinence time and fever

<sup>c</sup>Participants with recording of spillage excluded from analyses on semen volume and total sperm count (mill.)

<sup>d</sup>Analyses on total motility (A + B %) additionally adjusted for time to analysis

**Supplementary Table S3:** Adjusted outcome ratios including varicocele according to sugar-sweetened or artificially sweetened beverage consumption among participants, FEPOS 2017-2019

	<b>Sugar-sweetened beverage consumption</b>	<b>Artificially sweetened beverage consumption</b>
	Adjusted ratio and 95% CI <sup>a,b</sup>	Adjusted ratio and 95% CI <sup>a,b</sup>
<b>Semen parameters</b>		
Semen volume <sup>c</sup>	0.99 (0.91, 1.07)	1.03 (0.92, 1.16)
Sperm concentration	1.03 (0.89, 1.18)	0.96 (0.81,1.14)
Total motility <sup>d</sup>	0.98 (0.95, 1.02)	1.01 (0.98, 1.05)
Sperm morphology (% normal sperm)	0.98 (0.86, 1.11)	0.89 (0.77, 1.04)
Total sperm count <sup>c</sup>	0.97 (0.83, 1.14)	0.98 (0.80, 1.20)

<sup>a</sup>Ratio between the semen quality characteristics for moderate consumption (≥3 days per week) relative to infrequent consumption (<3 days per week)

<sup>b</sup>Adjusted for candy intake, cake intake, energy drink consumption, coffee consumption, smoking, maternal smoking, maternal BMI, parental socio-economic status, abstinence time, varicocele, and fever

<sup>c</sup>Participants with recording of spillage excluded from analyses on semen volume and total sperm count (mill.)

<sup>d</sup>Analyses on total motility (A + B %) additionally adjusted for time to analysis