Intake of dairy products and associations with major atherosclerotic cardiovascular diseases in the general adult population: a systematic review and meta-analysis of cohort studies

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Contents

1 Main Report

1.1 Milk

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for milk, 6 studies with 619460 participants and 16478 cases (overall intake range for studies reporting quantative exposure levels 0-710 g/d) were included for fatal and non-fatal CHD and 3 studies with 163128 participants and 3691 cases (overall intake range for studies reporting quantative exposure levels 0-710 g/d) were included for fatal and non-fatal ischemic stroke.

Comparing the highest category to the reference category of milk intake, no association between milk intake and risk of fatal and non-fatal CHD was observed (RR: 1.02; 95% CI 0.92 to 1.13, I^2 = 67%, $p_{heterogeneity}$ = 0.01), and inverse association between milk intake and risk of fatal and non-fatal ischemic stroke was observed (RR: 0.88; 95% CI 0.79 to 0.98, I^2 = 0%, $p_{heterogeneity}$ = 0.52). See figures 1_1_1-1_1_2.

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 200 g of milk were not associated with risk of fatal and non-fatal CHD (RR: 1.02; 95% CI 1 to 1.04, I^2 = 0%, $p_{heterogeneity}$ = 0.52, n = 5), and not associated with risk of fatal and non-fatal ischemic stroke (RR: 0.96; 95% CI 0.91 to 1.01, I^2 = 16%, $p_{heterogeneity}$ = 0.31, n = 3). See figures 1 _ 4 _[1,2]. There was no evidence of a non-linear dose response association for fatal and non-fatal CHD ($p_{non\text{-}linearity}$ =0.29, n = 4), and fatal and non-fatal ischemic stroke ($p_{non\text{-}linearity}$ =0.69, n = 2).

Heterogeneity

A stratified analysis for heterogeneity of subgroup differences, in the high-vs-low metaanalysis for the relation between milk intake and fatal and non-fatal CHD showed no heterogeneity for sex ($p_{heterogeneity}$ = 0.95). See figures 1_2_1[sex]. A stratified analysis for heterogeneity of subgroup differences, in the high-vs-low

metaanalysis for the relation between milk intake and fatal and non-fatal ischemic stroke showed no heterogeneity for sex ($p_{heterogeneity} = 0.83$) and no heterogeneity for continent ($p_{heterogeneity} = 0.32$). See figures 1_2_2[sex,continent].

A stratified analysis for heterogeneity of subgroup differences, in the dose-response metaanalysis for the relation between milk intake and fatal and non-fatal CHD showed no heterogeneity for sex ($p_{heterogeneity} = 0.24$). See figures 1_5_1[sex]. A stratified analysis for heterogeneity of subgroup differences, in the dose-response metaanalysis for the relation between milk intake and fatal and non-fatal ischemic stroke showed no heterogeneity for sex ($p_{heterogeneity} = 0.94$) and no heterogeneity for continent ($p_{heterogeneity} = 0.22$). See figures 1_5_2[sex,continent].

Publication bias

There was found no evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal CHD ($p_{Egger} = 0.57$), and no evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal ischemic stroke ($p_{Egger} = 0.26$). See figures 1_3_[1,2].

There was found no evidence of small study effects in the dose-response meta-analysis for fatal and non-fatal CHD ($p_{Egger} = 0.74$), and no evidence of small study effects in the dose-response meta-analysis for fatal and non-fatal ischemic stroke ($p_{Egger} = 0.12$). See figures 1_6_[1,2].

1.2 Butter

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for butter 4 studies with 128757 participants and 6562 cases (overall intake range for studies reporting quantative exposure levels 0-63 g/d) were included for fatal and non-fatal CHD.

Comparing the highest category to the reference category of butter intake, no association between butter intake and risk of fatal and non-fatal CHD was observed (RR: 0.99; 95% CI 0.92 to 1.07, $I^2 = 0\%$, $p_{heterogeneity} = 0.86$). See figure 2_1_1.

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 6 g of butter were not associated with risk of fatal and non-fatal CHD (RR: 1; 95% CI 0.99 to 1.01, $I^2 = 0\%$, $p_{heterogeneity} = 0.85$, n = 3), and not associated with risk of fatal and non-fatal ischemic stroke (RR: 1; 95% CI 0.99 to 1.01, $I^2 = 0\%$, $p_{heterogeneity} = 1$, n = 2). See figures 2 _ 4 _[1,2].

Heterogeneity

A stratified analysis for heterogeneity of subgroup differences, in the high-vs-low metaanalysis for the relation between butter intake and fatal and non-fatal CHD showed no heterogeneity for sex ($p_{heterogeneity} = 0.96$) and no heterogeneity for continent ($p_{heterogeneity} = 0.98$). See figures 2_2_1[sex,continent].

A stratified analysis for heterogeneity of subgroup differences, in the dose-response metaanalysis for the relation between butter intake and fatal and non-fatal CHD showed no heterogeneity for sex ($p_{heterogeneity} = 0.55$) and no heterogeneity for continent ($p_{heterogeneity} = 0.58$). See figures 2_5_1[sex,continent]. A stratified analysis for heterogeneity of subgroup differences, in the dose-response metaanalysis for the relation between butter intake and fatal and non-fatal ischemic stroke showed no heterogeneity for sex ($p_{heterogeneity} = 1$) and no heterogeneity for continent ($p_{heterogeneity} = 1$). See figures 2_5_2[sex,continent].

Publication bias

There was found no evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal CHD ($p_{Egger} = 0.6$). See figure 2_3_1.

There was found no evidence of small study effects in the dose-response meta-analysis for fatal and non-fatal CHD ($p_{Egger} = 0.95$). See figure 2_6_1. Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal ischemic stroke.

1.3 Low-fat milk

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for low-fat milk 5 studies with 5263 cases (overall intake range for studies reporting quantative exposure levels 0-678 g/d) were included for fatal and non-fatal CHD.

Comparing the highest category to the reference category of low-fat milk intake, no association between low-fat milk intake and risk of fatal and non-fatal CHD was observed (RR: 1.05; 95% CI 0.92 to 1.2, I^2 = 59%, $p_{heterogeneity}$ = 0.03). See figure 3_1_1.

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 200 g of low-fat milk were not associated with risk of fatal and non-fatal CHD (RR: 1.05; 95% CI 0.96 to 1.13, I^2 = 24%, $p_{heterogeneity}$ = 0.27, n = 3). See figure 3 _ 4 _ 1 . There was no evidence of a non-linear dose response association for fatal and non-fatal CHD ($p_{non\text{-}linearity}$ =0.94, n = 2).

Heterogeneity

A stratified analysis for heterogeneity of subgroup differences, in the high-vs-low metaanalysis for the relation between low-fat milk intake and fatal and non-fatal CHD showed no heterogeneity for sex ($p_{heterogeneity}$ = 0.54) and no heterogeneity for continent ($p_{heterogeneity}$ = 0.89). See figures 3_2_1[sex,continent].

A stratified analysis for heterogeneity of subgroup differences, in the dose-response metaanalysis for the relation between low-fat milk intake and fatal and non-fatal CHD showed no heterogeneity for sex ($p_{heterogeneity}$ = 0.48) and no heterogeneity for continent ($p_{heterogeneity}$ = 0.21). See figures 3_5_1[sex,continent].

Publication bias

There was found no evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal CHD (p_{Egger} = 0.77). See figure 3_3_1.

There was found no evidence of small study effects in the dose-response meta-analysis for fatal and non-fatal CHD (p_{Egger} = 0.21). See figure 3_6_1.

1.4 High-fat milk

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for high-fat milk 6 studies with 5762 cases (overall intake range for studies reporting quantative exposure levels 0-645 g/d) were included for fatal and non-fatal CHD.

Comparing the highest category to the reference category of high-fat milk intake, positive association between high-fat milk intake and risk of fatal and non-fatal CHD was observed (RR: 1.16; 95% CI 1.01 to 1.33, I^2 = 53%, $p_{heterogeneity}$ = 0.04). See figure 4_1_1.

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 200 g of high-fat milk were positively associated with risk of fatal and non-fatal CHD (RR: 1.08; 95% CI 1 to 1.16, I^2 = 0%, $p_{heterogeneity}$ = 0.94, n = 4). See figure 4 _ 4 _ 1 . There was no evidence of a non-linear dose response association for fatal and non-fatal CHD ($p_{non\text{-}linearity}$ =0.35, n = 3).

Heterogeneity

A stratified analysis for heterogeneity of subgroup differences, in the high-vs-low metaanalysis for the relation between high-fat milk intake and fatal and non-fatal CHD showed no heterogeneity for sex ($p_{heterogeneity}$ = 0.53) and no heterogeneity for continent ($p_{heterogeneity}$ = 0.47). See figures 4_2_1[sex,continent].

A stratified analysis for heterogeneity of subgroup differences, in the dose-response metaanalysis for the relation between high-fat milk intake and fatal and non-fatal CHD showed no heterogeneity for sex ($p_{heterogeneity}$ = 0.8) and no heterogeneity for continent ($p_{heterogeneity}$ = 0.71). See figures 4_5_1[sex,continent].

Publication bias

There was found no evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal CHD ($p_{Egger} = 0.4$). See figure 4_3_1.

There was found no evidence of small study effects in the dose-response meta-analysis for fatal and non-fatal CHD ($p_{Egger} = 0.79$). See figure 4_6_1.

1.5 Yogurt products

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for yogurt products, 6 studies with 552342 participants and 14226 cases (overall intake range for studies reporting quantative exposure levels 0-400 g/d) were included for fatal and non-fatal CHD and 3 studies with 187281 participants and 6208 cases (overall intake range for studies reporting quantative exposure levels 0-400 g/d) were included for fatal and non-fatal ischemic stroke.

Comparing the highest category to the reference category of yogurt products intake, no association between yogurt products intake and risk of fatal and non-fatal CHD was observed (RR: 0.99; 95% CI 0.91 to 1.08, $I^2 = 49\%$, $p_{heterogeneity} = 0.06$), and no association between yogurt products intake and risk of fatal and non-fatal ischemic stroke was observed (RR: 1.04; 95% CI 0.95 to 1.13, $I^2 = 0\%$, $p_{heterogeneity} = 0.42$). See figures 5_1_1-5_1_2.

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 100 g of yogurt products were not associated with risk of fatal and non-fatal ischemic stroke (RR: 0.99; 95% CI 0.9 to 1.1, $I^2 = 12\%$, $p_{heterogeneity} = 0.29$, n = 2), and not associated with risk of fatal and non-fatal CHD (RR: 0.98; 95% CI 0.93 to 1.03, $I^2 = 42\%$, $p_{heterogeneity} = 0.11$, n = 5). See figures 5 _ 4 _[1,2]. There was no evidence of a non-linear dose response association for fatal and non-fatal CHD ($p_{non\text{-}linearity}$ =1, n = 3).

Heterogeneity

A stratified analysis for heterogeneity of subgroup differences, in the high-vs-low metaanalysis for the relation between yogurt products intake and fatal and non-fatal CHD showed no heterogeneity for sex ($p_{heterogeneity}$ = 0.97) and heterogeneity for continent ($p_{heterogeneity} = 0.05$). See figures 5_2_1[sex,continent]. A stratified analysis for heterogeneity of subgroup differences, in the high-vs-low metaanalysis for the relation between yogurt products intake and fatal and non-fatal ischemic stroke showed no heterogeneity for sex ($p_{heterogeneity}$ = 0.22) and no heterogeneity for continent ($p_{heterogeneity} = 0.26$). See figures 5_2_2[sex,continent].

A stratified analysis for heterogeneity of subgroup differences, in the dose-response metaanalysis for the relation between yogurt products intake and fatal and non-fatal CHD showed no heterogeneity for sex ($p_{heterogeneity} = 0.72$) and heterogeneity for continent ($p_{heterogeneity} = 0.05$). See figures 5_5_1[sex,continent]. A stratified analysis for heterogeneity of subgroup differences, in the dose-response metaanalysis for the relation between yogurt products intake and fatal and non-fatal ischemic stroke showed no heterogeneity for continent ($p_{heterogeneity} = 0.29$). See figures 5_5_2[continent].

Publication bias

There was found evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal CHD (p_{Egger} <0.001), and no evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal ischemic stroke ($p_{Egger} = 0.45$). See figures 5_3_[1,2].

There was found no evidence of small study effects in the dose-response meta-analysis for fatal and non-fatal CHD ($p_{Egger} = 0.14$). See figure 5_6_1. Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal ischemic stroke.

1.6 Cheese

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for cheese, 7 studies with 554323 participants and 14698 cases (overall intake range for studies reporting quantative exposure levels 0-120 g/d) were included for fatal and non-fatal CHD and 3 studies with 187281 participants and 6208 cases (overall intake range for studies reporting quantative exposure levels 0-100 g/d) were included for fatal and non-fatal ischemic stroke.

Comparing the highest category to the reference category of cheese intake, inverse association between cheese intake and risk of fatal and non-fatal CHD was observed (RR: 0.91; 95% CI 0.84 to 0.99, I^2 = 37%, $p_{heterogeneity}$ = 0.12), and no association between cheese intake and risk of fatal and non-fatal ischemic stroke was observed (RR: 0.89; 95% CI 0.78 to 1.01, I^2 = 37%, $p_{heterogeneity}$ = 0.2). See figures 6_1_1-6_1_2.

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 20 g of cheese were inversely associated with risk of fatal and non-fatal CHD (RR: 0.96; 95% CI 0.93 to 0.98, I^2 = 3%, $p_{heterogeneity}$ = 0.41, n = 6), and not associated with risk of fatal and non-fatal ischemic stroke (RR: 0.96; 95% CI 0.91 to 1.01, I^2 = 67%, $p_{heterogeneity}$ = 0.05, n = 3). See figures 6 _ 4 _[1,2]. There was no evidence of a non-linear dose response association for fatal and non-fatal CHD ($p_{non\text{-}linearity}$ =0.82, n = 4), and fatal and non-fatal ischemic stroke ($p_{non\text{-}linearity}$ =0.6, n = 2).

Heterogeneity

A stratified analysis for heterogeneity of subgroup differences, in the high-vs-low metaanalysis for the relation between cheese intake and fatal and non-fatal CHD showed heterogeneity for sex ($p_{heterogeneity}$ = 0.03) and no heterogeneity for continent ($p_{heterogeneity}$ = 0.98). See figures 6_2_1[sex,continent]. A stratified analysis for heterogeneity of subgroup differences, in the high-vs-low metaanalysis for the relation between cheese intake and fatal and non-fatal ischemic stroke showed no heterogeneity for sex ($p_{heterogeneity}$ = 0.17) and no heterogeneity for continent ($p_{heterogeneity}$ = 0.11). See figures 6_2_2[sex,continent].

A stratified analysis for heterogeneity of subgroup differences, in the dose-response metaanalysis for the relation between cheese intake and fatal and non-fatal CHD showed no heterogeneity for sex ($p_{heterogeneity}$ = 0.55) and no heterogeneity for continent ($p_{heterogeneity}$ = 0.9). See figures 6_5_1[sex,continent]. A stratified analysis for heterogeneity of subgroup differences, in the dose-response metaanalysis for the relation between cheese intake and fatal and non-fatal ischemic stroke showed no heterogeneity for sex ($p_{heterogeneity}$ = 0.14) and no heterogeneity for continent ($p_{heterogeneity}$ = 0.09). See figures 6_5_2[sex,continent].

Publication bias

There was found no evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal CHD (p_{Egger} = 0.73), and no evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal ischemic stroke (p_{Egger} = 0.25). See figures 6_3_[1,2].

There was found no evidence of small study effects in the dose-response meta-analysis for fatal and non-fatal CHD (p_{Egger} = 0.77), and no evidence of small study effects in the dose-response meta-analysis for fatal and non-fatal ischemic stroke (p_{Egger} = 0.22). See figures 6_6_[1,2].

1.7 Low-fat cheese

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for low-fat cheese 3 studies with 5081 cases (overall intake range for studies reporting quantative exposure levels 0-54 g/d) were included for fatal and non-fatal CHD.

Comparing the highest category to the reference category of low-fat cheese intake, no association between low-fat cheese intake and risk of fatal and non-fatal CHD was observed (RR: 1.17; 95% CI 0.85 to 1.61, I^2 = 85%, $p_{heterogeneity}$ <0.001). See figure 7_1_1.

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 20 g of low-fat cheese were not associated with risk of fatal and non-fatal CHD (RR: 1.24; 95% CI 0.76 to 2.04, I^2 = 90%, $p_{heterogeneity}$ <0.001, n = 2). See figure 7 _ 4 _ 1 .

Heterogeneity

A stratified analysis for heterogeneity of subgroup differences, in the high-vs-low metaanalysis for the relation between low-fat cheese intake and fatal and non-fatal CHD showed no heterogeneity for sex ($p_{heterogeneity}$ = 0.53) and no heterogeneity for continent ($p_{heterogeneity}$ = 0.33). See figures 7_2_1[sex,continent].

A stratified analysis for heterogeneity of subgroup differences, in the dose-response metaanalysis for the relation between low-fat cheese intake and fatal and non-fatal CHD showed no heterogeneity for sex ($p_{heterogeneity}$ = 0.44) and no heterogeneity for continent ($p_{heterogeneity}$ = 0.27). See figures 7_5_1[sex,continent].

Publication bias

There was found no evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal CHD (p_{Egger} = 0.73). See figure 7_3_1.

Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal CHD.

1.8 Low-fat yogurt products

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for low-fat yogurt products 2 studies with 4429 cases (overall intake range for studies reporting quantative exposure levels 0-200 g/d) were included for fatal and non-fatal CHD.

Comparing the highest category to the reference category of low-fat yogurt products intake, no association between low-fat yogurt products intake and risk of fatal and non-fatal CHD was observed (RR: 0.97; 95% CI 0.89 to 1.06, I^2 = 0%, $p_{heterogeneity}$ = 0.83). See figure 8_1_1.

Dose-response meta-analysis

Heterogeneity

Publication bias

Egger's test for publication bias for the high-vs-low metaanalysis could not be performed for fatal and non-fatal CHD.

1.9 High-fat yogurt products

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for high-fat yogurt products 2 studies with 5254 cases (overall intake range for studies reporting quantative exposure levels 0-200 g/d) were included for fatal and non-fatal CHD.

Comparing the highest category to the reference category of high-fat yogurt products intake, no association between high-fat yogurt products intake and risk of fatal and non-fatal CHD was observed (RR: 1.01; 95% CI 0.93 to 1.09, I^2 = 0%, $p_{heterogeneity}$ = 0.64). See figure 9_1_1.

Dose-response meta-analysis

Heterogeneity

Publication bias

Egger's test for publication bias for the high-vs-low metaanalysis could not be performed for fatal and non-fatal CHD.

1.10 High-fat cheese

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for high-fat cheese 2 studies with 5065 cases (overall intake range for studies reporting quantative exposure levels 0-80 g/d) were included for fatal and non-fatal CHD.

Comparing the highest category to the reference category of high-fat cheese intake, no association between high-fat cheese intake and risk of fatal and non-fatal CHD was observed (RR: 0.94; 95% CI 0.77 to 1.14, I^2 = 71%, $p_{heterogeneity}$ = 0.06). See figure 10_1_1.

Dose-response meta-analysis

Heterogeneity

Publication bias

Egger's test for publication bias for the high-vs-low metaanalysis could not be performed for fatal and non-fatal CHD.

1.11 Low-fat milk for high-fat milk

High vs. low intake meta-analysis

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 1 serving of low-fat milk for high-fat milk were not associated with risk of fatal and non-fatal ischemic stroke (RR: 0.98; 95% CI 0.91 to 1.05, I^2 = 0%, $p_{heterogeneity}$ = 0.95, n = 2). See figure 11 _ 4 _ 1 .

Heterogeneity

Publication bias

Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal ischemic stroke.

1.12 Low-fat yogurt products for high-fat yogurt products

High vs. low intake meta-analysis

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 1 serving of low-fat yogurt products for high-fat yogurt products were not associated with risk of fatal and non-fatal ischemic stroke (RR: 1.57; 95% CI 0.77 to 3.21, I^2 = 67%, $p_{heterogeneity}$ = 0.08, n = 2). See figure 12 _ 4 _ 1 .

Heterogeneity

Publication bias

Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal ischemic stroke.

1.13 Low-fat yogurt products for low-fat milk

High vs. low intake meta-analysis

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 1 serving of low-fat yogurt products for low-fat milk were not associated with risk of fatal and non-fatal ischemic stroke (RR: 0.98; 95% CI 0.86 to 1.12, $I^2 = 7\%$, $p_{heterogeneity} = 0.3$, n = 2). See figure 13 _ 4 _ 1 .

Heterogeneity

Publication bias

Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal ischemic stroke.

1.14 Low-fat yogurt products for high-fat milk

High vs. low intake meta-analysis

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 1 serving of low-fat yogurt products for high-fat milk were not associated with risk of fatal and non-fatal ischemic stroke (RR: 0.97; 95% CI 0.85 to 1.11, $I^2 = 0\%$, $p_{heterogeneity} = 0.37$, n = 2). See figure 14 _ 4 _ 1 .

Heterogeneity

Publication bias

Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal ischemic stroke.

1.15 High-fat yogurt products for low-fat milk

High vs. low intake meta-analysis

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 1 serving of high-fat yogurt products for low-fat milk were not associated with risk of fatal and non-fatal ischemic stroke (RR: 0.59; 95% CI 0.24 to 1.42, $I^2 = 79\%$, $p_{heterogeneity} = 0.03$, n = 2). See figure 15 _ 4 _ 1 .

Heterogeneity

Publication bias

Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal ischemic stroke.

1.16 High-fat yogurt products for high-fat milk

High vs. low intake meta-analysis

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 1 serving of high-fat yogurt products for high-fat milk were not associated with risk of fatal and non-fatal ischemic stroke (RR: 0.58; 95% CI 0.24 to 1.42, $I^2 = 79\%$, $p_{heterogeneity} = 0.03$, n = 2). See figure 16 _ 4 _ 1 .

Heterogeneity

Publication bias

Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal ischemic stroke.

1.17 Cheese for low-fat milk

High vs. low intake meta-analysis

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 1 serving of cheese for low-fat milk were not associated with risk of fatal and non-fatal ischemic stroke (RR: 0.97; 95% CI 0.92 to 1.02, $I^2 = 0\%$, $p_{heterogeneity} = 0.91$, n = 2). See figure 17 _ 4 _ 1 .

Heterogeneity

Publication bias

Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal ischemic stroke.

1.18 Cheese for high-fat milk

High vs. low intake meta-analysis

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 1 serving of cheese for high-fat milk were not associated with risk of fatal and non-fatal ischemic stroke (RR: 0.95; 95% CI 0.88 to 1.02, $I^2 = 0\%$, $p_{heterogeneity} = 0.9$, n = 2). See figure 18 _ 4 _ 1 .

Heterogeneity

Publication bias

Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal ischemic stroke.

1.19 Cheese for low-fat yogurt products

High vs. low intake meta-analysis

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 1 serving of cheese for low-fat yogurt products were not associated with risk of fatal and non-fatal ischemic stroke (RR: 0.98; 95% CI 0.87 to 1.11, $I^2 = 0\%$, $p_{heterogeneity} = 0.32$, n = 2). See figure 19 _ 4 _ 1 .

Heterogeneity

Publication bias

Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal ischemic stroke.

1.20 Cheese for high-fat yogurt products

High vs. low intake meta-analysis

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 1 serving of cheese for high-fat yogurt products were not associated with risk of fatal and non-fatal ischemic stroke (RR: 1.66; 95% CI 0.68 to 4.02, $I^2 = 80\%$, $p_{heterogeneity} = 0.02$, n = 2). See figure 20 _ 4 _ 1 .

Heterogeneity

Publication bias

Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal ischemic stroke.

1.21 Cheese for butter

High vs. low intake meta-analysis

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 1 serving of cheese for butter were not associated with risk of fatal and non-fatal ischemic stroke (RR: 0.98; 95% CI 0.94 to 1.02, $I^2 = 0\%$, $p_{heterogeneity} = 0.42$, n = 2). See figure 21 _ 4 _ 1 .

Heterogeneity

Publication bias

Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal ischemic stroke.

1.22 Low-fat yogurt products for butter

High vs. low intake meta-analysis

Dose-response meta-analysis

Heterogeneity

Publication bias

1.23 High-fat yogurt products for butter

High vs. low intake meta-analysis

Dose-response meta-analysis

Heterogeneity

Publication bias

1.24 Low-fat milk for butter

High vs. low intake meta-analysis

Dose-response meta-analysis

Heterogeneity

Publication bias

1.25 High-fat milk for butter

High vs. low intake meta-analysis

Dose-response meta-analysis

Heterogeneity

Publication bias

2 Sensitivity analysis (Fixed effects models)

2.1 Milk

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for milk, 6 studies with 619460 participants and 16478 cases (overall intake range for studies reporting quantative exposure levels 0-710 g/d) were included for fatal and non-fatal CHD and 3 studies with 163128 participants and 3691 cases (overall intake range for studies reporting quantative exposure levels 0-710 g/d) were included for fatal and non-fatal ischemic stroke.

Comparing the highest category to the reference category of milk intake, no association between milk intake and risk of fatal and non-fatal CHD was observed (RR: 1.03; 95% CI 0.97 to 1.08), and inverse association between milk intake and risk of fatal and non-fatal ischemic stroke was observed (RR: 0.88; 95% CI 0.79 to 0.98). See figures 1_1_1-1_1_2.

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 200 g of milk were not associated with risk of fatal and non-fatal CHD (RR: 1.02; 95% CI 1 to 1.04, n = 5), and inversely associated with risk of fatal and non-fatal ischemic stroke (RR: 0.97; 95% CI 0.94 to 1, n = 3). See figures 1 _ 4 _[1,2]. There was no evidence of a non-linear dose response association for fatal and non-fatal CHD ($p_{\text{non-linearity}}$ =0.21, n = 4), and fatal and non-fatal ischemic stroke ($p_{\text{non-linearity}}$ =0.54, n = 2).

Publication bias

There was found no evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal CHD (p_{Egger} = 0.57), and no evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal ischemic stroke (p_{Egger} = 0.26). See figures 1_3_[1,2].

There was found no evidence of small study effects in the dose-response meta-analysis for fatal and non-fatal CHD (p_{Egger} = 0.74), and no evidence of small study effects in the dose-response meta-analysis for fatal and non-fatal ischemic stroke (p_{Egger} = 0.12). See figures 1_6_[1,2].

2.2 Butter

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for butter 4 studies with 128757 participants and 6562 cases (overall intake range for studies reporting quantative exposure levels 0-63 g/d) were included for fatal and non-fatal CHD.

Comparing the highest category to the reference category of butter intake, no association between butter intake and risk of fatal and non-fatal CHD was observed (RR: 0.99; 95% CI 0.92 to 1.07). See figure 2_1_1.

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 6 g of butter were not associated with risk of fatal and non-fatal CHD (RR: 1; 95% CI 0.99 to 1.01, n = 3), and not associated with risk of fatal and non-fatal ischemic stroke (RR: 1; 95% CI 0.99 to 1.01, n = 2). See figures 2 _ 4 _[1,2].

Publication bias

There was found no evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal CHD (p_{Egger} = 0.6). See figure 2_3_1.

There was found no evidence of small study effects in the dose-response meta-analysis for fatal and non-fatal CHD (p_{Egger} = 0.95). See figure 2_6_1. Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal ischemic stroke.

2.3 Low-fat milk

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for low-fat milk 5 studies with 5263 cases (overall intake range for studies reporting quantative exposure levels 0-678 g/d) were included for fatal and non-fatal CHD.

Comparing the highest category to the reference category of low-fat milk intake, no association between low-fat milk intake and risk of fatal and non-fatal CHD was observed (RR: 1.05; 95% CI 0.97 to 1.13). See figure 3_1_1.

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 200 g of low-fat milk were not associated with risk of fatal and non-fatal CHD (RR: 1.04; 95% CI 0.98 to 1.1, n = 3). See figure 3 _ 4 _ 1 . There was no evidence of a non-linear dose response association for fatal and non-fatal CHD ($p_{non\text{-}linearity}$ =0.94, n = 2).

Publication bias

There was found no evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal CHD (p_{Egger} = 0.77). See figure 3_3_1.

There was found no evidence of small study effects in the dose-response meta-analysis for fatal and non-fatal CHD (p_{Egger} = 0.21). See figure 3_6_1.

2.4 High-fat milk

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for high-fat milk 6 studies with 5762 cases (overall intake range for studies reporting quantative exposure levels 0-645 g/d) were included for fatal and non-fatal CHD.

Comparing the highest category to the reference category of high-fat milk intake, positive association between high-fat milk intake and risk of fatal and non-fatal CHD was observed (RR: 1.12; 95% CI 1.03 to 1.22). See figure 4_1_1.

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 200 g of high-fat milk were positively associated with risk of fatal and non-fatal CHD (RR: 1.08; 95% CI 1 to 1.16, n = 4). See figure 4 _ 4 _ 1 . There was no evidence of a non-linear dose response association for fatal and non-fatal CHD ($p_{non\text{-}linearity}$ =0.86, n = 3).

Publication bias

There was found no evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal CHD (p_{Egger} = 0.4). See figure 4_3_1.

There was found no evidence of small study effects in the dose-response meta-analysis for fatal and non-fatal CHD (p_{Egger} = 0.79). See figure 4_6_1.

2.5 Yogurt products

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for yogurt products, 6 studies with 552342 participants and 14226 cases (overall intake range for studies reporting quantative exposure levels 0-400 g/d) were included for fatal and non-fatal CHD and 3 studies with 187281 participants and 6208 cases (overall intake range for studies reporting quantative exposure levels 0-400 g/d) were included for fatal and non-fatal ischemic stroke.

Comparing the highest category to the reference category of yogurt products intake, inverse association between yogurt products intake and risk of fatal and non-fatal CHD was observed (RR: 0.95; 95% CI 0.9 to 0.99), and no association between yogurt products intake and risk of fatal and non-fatal ischemic stroke was observed (RR: 1.04; 95% CI 0.95 to 1.13). See figures 5_1_1-5_1_2.

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 100 g of yogurt products were not associated with risk of fatal and non-fatal ischemic stroke (RR: 1.01; 95% CI 0.98 to 1.03, n = 2), and not associated with risk of fatal and non-fatal CHD (RR: 0.97; 95% CI 0.94 to 1, n = 5). See figures 5 _ 4 _[1,2]. There was no evidence of a non-linear dose response association for fatal and non-fatal CHD ($p_{non\text{-}linearity}$ =0.05, n = 3).

Publication bias

There was found evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal CHD (p_{Egger} <0.001), and no evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal ischemic stroke (p_{Egger} = 0.45). See figures 5_3_[1,2].

There was found no evidence of small study effects in the dose-response meta-analysis for fatal and non-fatal CHD (p_{Egger} = 0.14). See figure 5_6_1. Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal ischemic stroke.

2.6 Cheese

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for cheese, 7 studies with 554323 participants and 14698 cases (overall intake range for studies reporting quantative exposure levels 0-120 g/d) were included for fatal and non-fatal CHD and 3 studies with 187281 participants and 6208 cases (overall intake range for studies reporting quantative exposure levels 0-100 g/d) were included for fatal and non-fatal ischemic stroke.

Comparing the highest category to the reference category of cheese intake, inverse association between cheese intake and risk of fatal and non-fatal CHD was observed (RR: 0.92; 95% CI 0.87 to 0.97), and inverse association between cheese intake and risk of fatal and non-fatal ischemic stroke was observed (RR: 0.9; 95% CI 0.83 to 0.99). See figures 6_1_1-6_1_2.

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 20 g of cheese were inversely associated with risk of fatal and non-fatal CHD (RR: 0.96; 95% CI 0.93 to 0.98, n = 6), and inversely associated with risk of fatal and non-fatal ischemic stroke (RR: 0.98; 95% CI 0.96 to 1, n = 3). See figures 6 _ 4 _[1,2]. There was no evidence of a non-linear dose response association for fatal and non-fatal CHD ($p_{non\text{-}linearity}$ =0.82, n = 4), and fatal and non-fatal ischemic stroke ($p_{non\text{-}linearity}$ =0.79, n = 2).

Publication bias

There was found no evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal CHD ($p_{Egger} = 0.73$), and no evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal ischemic stroke ($p_{Egger} = 0.25$). See figures 6_3_[1,2].

There was found no evidence of small study effects in the dose-response meta-analysis for fatal and non-fatal CHD ($p_{Egger} = 0.77$), and no evidence of small study effects in the dose-response meta-analysis for fatal and non-fatal ischemic stroke ($p_{Egger} = 0.22$). See figures 6_6_[1,2].

2.7 Low-fat cheese

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for low-fat cheese 3 studies with 5081 cases (overall intake range for studies reporting quantative exposure levels 0-54 g/d) were included for fatal and non-fatal CHD.

Comparing the highest category to the reference category of low-fat cheese intake, no association between low-fat cheese intake and risk of fatal and non-fatal CHD was observed (RR: 1.09; 95% CI 0.99 to 1.19). See figure 7_1_1.

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 20 g of low-fat cheese were not associated with risk of fatal and non-fatal CHD (RR: 0.98; 95% CI 0.91 to 1.07, n = 2). See figure 7 _ 4 _ 1 .

Publication bias

There was found no evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal CHD ($p_{Egger} = 0.73$). See figure 7_3_1.

Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal CHD.

2.8 Low-fat yogurt products

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for low-fat yogurt products 2 studies with 4429 cases (overall intake range for studies reporting quantative exposure levels 0-200 g/d) were included for fatal and non-fatal CHD.

Comparing the highest category to the reference category of low-fat yogurt products intake, no association between low-fat yogurt products intake and risk of fatal and non-fatal CHD was observed (RR: 0.97; 95% CI 0.89 to 1.06). See figure 8_1_1.

Dose-response meta-analysis

Publication bias

Egger's test for publication bias for the high-vs-low metaanalysis could not be performed for fatal and non-fatal CHD.

2.9 High-fat yogurt products

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for high-fat yogurt products 2 studies with 5254 cases (overall intake range for studies reporting quantative exposure levels 0-200 g/d) were included for fatal and non-fatal CHD.

Comparing the highest category to the reference category of high-fat yogurt products intake, no association between high-fat yogurt products intake and risk of fatal and non-fatal CHD was observed (RR: 1.01; 95% CI 0.93 to 1.09). See figure 9_1_1.

Dose-response meta-analysis

Publication bias

Egger's test for publication bias for the high-vs-low metaanalysis could not be performed for fatal and non-fatal CHD.

2.10 High-fat cheese

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for high-fat cheese 2 studies with 5065 cases (overall intake range for studies reporting quantative exposure levels 0-80 g/d) were included for fatal and non-fatal CHD.

Comparing the highest category to the reference category of high-fat cheese intake, no association between high-fat cheese intake and risk of fatal and non-fatal CHD was observed (RR: 0.99; 95% CI 0.91 to 1.07). See figure 10_1_1.

Dose-response meta-analysis

Publication bias

Egger's test for publication bias for the high-vs-low metaanalysis could not be performed for fatal and non-fatal CHD.

2.11 Low-fat milk for high-fat milk

High vs. low intake meta-analysis

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 1 serving of low-fat milk for high-fat milk were not associated with risk of fatal and non-fatal ischemic stroke (RR: 0.98; 95% CI 0.91 to 1.05, n = 2). See figure 11 _ 4 _ 1 .

Publication bias

Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal ischemic stroke.

2.12 Low-fat yogurt products for high-fat yogurt products

High vs. low intake meta-analysis

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 1 serving of low-fat yogurt products for high-fat yogurt products were positively associated with risk of fatal and non-fatal ischemic stroke (RR: 1.25; 95% CI 1.03 to 1.5, n = 2). See figure 12 _ 4 _ 1 .

Publication bias

Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal ischemic stroke.

2.13 Low-fat yogurt products for low-fat milk

High vs. low intake meta-analysis

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 1 serving of low-fat yogurt products for low-fat milk were not associated with risk of fatal and non-fatal ischemic stroke (RR: 0.98; 95% CI 0.87 to 1.12, n = 2). See figure 13 _ 4 _ 1 .

Publication bias

Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal ischemic stroke.

2.14 Low-fat yogurt products for high-fat milk

High vs. low intake meta-analysis

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 1 serving of low-fat yogurt products for high-fat milk were not associated with risk of fatal and non-fatal ischemic stroke (RR: 0.97; 95% CI 0.85 to 1.11, n = 2). See figure 14 _ 4 _ 1 .

Publication bias

Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal ischemic stroke.

2.15 High-fat yogurt products for low-fat milk

High vs. low intake meta-analysis

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 1 serving of high-fat yogurt products for low-fat milk were inversely associated with risk of fatal and non-fatal ischemic stroke (RR: 0.83; 95% CI 0.72 to 0.95, n = 2). See figure 15 _ 4 _ 1 .

Publication bias

Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal ischemic stroke.

2.16 High-fat yogurt products for high-fat milk

High vs. low intake meta-analysis

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 1 serving of high-fat yogurt products for high-fat milk were inversely associated with risk of fatal and non-fatal ischemic stroke (RR: 0.81; 95% CI 0.69 to 0.95, n = 2). See figure 16 _ 4 _ 1 .

Publication bias

Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal ischemic stroke.

2.17 Cheese for low-fat milk

High vs. low intake meta-analysis

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 1 serving of cheese for low-fat milk were not associated with risk of fatal and non-fatal ischemic stroke (RR: 0.97; 95% CI 0.92 to 1.02, n = 2). See figure 17 _ 4 _ 1 .

Publication bias

Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal ischemic stroke.

2.18 Cheese for high-fat milk

High vs. low intake meta-analysis

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 1 serving of cheese for high-fat milk were not associated with risk of fatal and non-fatal ischemic stroke (RR: 0.95; 95% CI 0.88 to 1.02, n = 2). See figure 18 _ 4 _ 1 .

Publication bias

Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal ischemic stroke.

2.19 Cheese for low-fat yogurt products

High vs. low intake meta-analysis

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 1 serving of cheese for low-fat yogurt products were not associated with risk of fatal and non-fatal ischemic stroke (RR: 0.98; 95% CI 0.87 to 1.11, n = 2). See figure 19 _ 4 _ 1 .

Publication bias

Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal ischemic stroke.

2.20 Cheese for high-fat yogurt products

High vs. low intake meta-analysis

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 1 serving of cheese for high-fat yogurt products were positively associated with risk of fatal and non-fatal ischemic stroke (RR: 1.18; 95% CI 1.02 to 1.36, n = 2). See figure 20 _ 4 _ 1 .

Publication bias

Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal ischemic stroke.

2.21 Cheese for butter

High vs. low intake meta-analysis

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 1 serving of cheese for butter were not associated with risk of fatal and non-fatal ischemic stroke (RR: 0.98; 95% CI 0.94 to 1.02, n = 2). See figure 21 _ 4 _ 1 .

Publication bias

Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal ischemic stroke.

2.22 Low-fat yogurt products for butter

High vs. low intake meta-analysis

Dose-response meta-analysis

Publication bias

2.23 High-fat yogurt products for butter

High vs. low intake meta-analysis

Dose-response meta-analysis

Publication bias

2.24 Low-fat milk for butter

High vs. low intake meta-analysis

Dose-response meta-analysis

Publication bias

2.25 High-fat milk for butter

High vs. low intake meta-analysis

Dose-response meta-analysis

Publication bias

3 Sensitivity analysis (Risk of bias)

3.1 Milk

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for milk, 6 studies with 619460 participants and 16478 cases (overall intake range for studies reporting quantative exposure levels 0-710 g/d) were included for fatal and non-fatal CHD and 3 studies with 163128 participants and 3691 cases (overall intake range for studies reporting quantative exposure levels 0-710 g/d) were included for fatal and non-fatal ischemic stroke.

Comparing the highest category to the reference category of milk intake, no association between milk intake and risk of fatal and non-fatal CHD was observed (RR: 1.02; 95% CI 0.92 to 1.13, I^2 = 67%, $p_{heterogeneity}$ = 0.01), and inverse association between milk intake and risk of fatal and non-fatal ischemic stroke was observed (RR: 0.88; 95% CI 0.79 to 0.98, I^2 = 0%, $p_{heterogeneity}$ = 0.52). See figures 1_1_1-1_1_2.

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 200 g of milk were not associated with risk of fatal and non-fatal CHD (RR: 1.02; 95% CI 1 to 1.04, I^2 = 0%, $p_{heterogeneity}$ = 0.52, n = 5), and not associated with risk of fatal and non-fatal ischemic stroke (RR: 0.96; 95% CI 0.91 to 1.01, I^2 = 16%, $p_{heterogeneity}$ = 0.31, n = 3). See figures 1 _ 4 _[1,2]. There was no evidence of a non-linear dose response association for fatal and non-fatal CHD ($p_{non\text{-}linearity}$ =0.29, n = 4), and fatal and non-fatal ischemic stroke ($p_{non\text{-}linearity}$ =0.69, n = 2).

Heterogeneity

A stratified analysis for heterogeneity of subgroup differences, in the high-vs-low metaanalysis for the relation between milk intake and fatal and non-fatal CHD showed no heterogeneity for sex ($p_{heterogeneity}$ = 0.95). See figures 1_2_1[sex]. A stratified analysis for heterogeneity of subgroup differences, in the high-vs-low metaanalysis for the relation between milk intake and fatal and non-fatal ischemic stroke showed no heterogeneity for sex ($p_{heterogeneity}$ = 0.83) and no heterogeneity for continent ($p_{heterogeneity}$ = 0.32). See figures 1_2_2[sex,continent].

A stratified analysis for heterogeneity of subgroup differences, in the dose-response metaanalysis for the relation between milk intake and fatal and non-fatal CHD showed no heterogeneity for sex ($p_{heterogeneity}$ = 0.24). See figures 1_5_1[sex]. A stratified analysis for heterogeneity of subgroup differences, in the dose-response metaanalysis for the relation between milk intake and fatal and non-fatal ischemic stroke showed no heterogeneity for sex ($p_{heterogeneity}$ = 0.94) and no heterogeneity for continent ($p_{heterogeneity}$ = 0.22). See figures 1_5_2[sex,continent].

Publication bias

There was found no evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal CHD (p_{Egger} = 0.57), and no evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal ischemic stroke (p_{Egger} = 0.26). See figures 1_3_[1,2].

There was found no evidence of small study effects in the dose-response meta-analysis for fatal and non-fatal CHD (p_{Egger} = 0.74), and no evidence of small study effects in the dose-response meta-analysis for fatal and non-fatal ischemic stroke (p_{Egger} = 0.12). See figures 1_6_[1,2].

3.2 Butter

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for butter 4 studies with 128757 participants and 6562 cases (overall intake range for studies reporting quantative exposure levels 0-63 g/d) were included for fatal and non-fatal CHD.

Comparing the highest category to the reference category of butter intake, no association between butter intake and risk of fatal and non-fatal CHD was observed (RR: 0.99; 95% CI 0.92 to 1.07, I^2 = 0%, $p_{heterogeneity}$ = 0.86). See figure 2_1_1.

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 6 g of butter were not associated with risk of fatal and non-fatal CHD (RR: 1; 95% CI 0.99 to 1.01, I^2 = 0%, $p_{heterogeneity}$ = 0.85, n = 3), and not associated with risk of fatal and non-fatal ischemic stroke (RR: 1; 95% CI 0.99 to 1.01, I^2 = 0%, $p_{heterogeneity}$ = 1, n = 2). See figures 2 _ 4 _[1,2].

Heterogeneity

A stratified analysis for heterogeneity of subgroup differences, in the high-vs-low metaanalysis for the relation between butter intake and fatal and non-fatal CHD showed no heterogeneity for sex ($p_{heterogeneity}$ = 0.96) and no heterogeneity for continent ($p_{heterogeneity}$ = 0.98). See figures 2_2_1[sex,continent].

A stratified analysis for heterogeneity of subgroup differences, in the dose-response metaanalysis for the relation between butter intake and fatal and non-fatal CHD showed no heterogeneity for sex ($p_{heterogeneity}$ = 0.55) and no heterogeneity for continent ($p_{heterogeneity}$ = 0.58). See figures 2_5_1[sex,continent]. A stratified analysis for heterogeneity of subgroup differences, in the dose-response metaanalysis for the relation between butter intake and fatal and non-fatal ischemic stroke showed no heterogeneity for sex ($p_{heterogeneity}$ = 1) and no heterogeneity for continent ($p_{heterogeneity}$ = 1). See figures 2_5_2[sex,continent].

Publication bias

There was found no evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal CHD (p_{Egger} = 0.6). See figure 2_3_1.

There was found no evidence of small study effects in the dose-response meta-analysis for fatal and non-fatal CHD (p_{Egger} = 0.95). See figure 2_6_1. Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal ischemic stroke.

3.3 Low-fat milk

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for low-fat milk 5 studies with 5263 cases (overall intake range for studies reporting quantative exposure levels 0-678 g/d) were included for fatal and non-fatal CHD.

Comparing the highest category to the reference category of low-fat milk intake, no association between low-fat milk intake and risk of fatal and non-fatal CHD was observed (RR: 1.05; 95% CI 0.92 to 1.2, I^2 = 59%, $p_{heterogeneity}$ = 0.03). See figure 3_1_1.

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 200 g of low-fat milk were not associated with risk of fatal and non-fatal CHD (RR: 1.05; 95% CI 0.96 to 1.13, I^2 = 24%, $p_{heterogeneity}$ = 0.27, n = 3). See figure 3 _ 4 _ 1 . There was no evidence of a non-linear dose response association for fatal and non-fatal CHD ($p_{non\text{-}linearity}$ =0.94, n = 2).

Heterogeneity

A stratified analysis for heterogeneity of subgroup differences, in the high-vs-low metaanalysis for the relation between low-fat milk intake and fatal and non-fatal CHD showed no heterogeneity for sex ($p_{heterogeneity}$ = 0.54) and no heterogeneity for continent ($p_{heterogeneity}$ = 0.89). See figures 3_2_1[sex,continent].

A stratified analysis for heterogeneity of subgroup differences, in the dose-response metaanalysis for the relation between low-fat milk intake and fatal and non-fatal CHD showed no heterogeneity for sex ($p_{heterogeneity}$ = 0.48) and no heterogeneity for continent ($p_{heterogeneity}$ = 0.21). See figures 3_5_1[sex,continent].

Publication bias

There was found no evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal CHD (p_{Egger} = 0.77). See figure 3_3_1.

There was found no evidence of small study effects in the dose-response meta-analysis for fatal and non-fatal CHD (p_{Egger} = 0.21). See figure 3_6_1.

3.4 High-fat milk

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for high-fat milk 5 studies with 5198 cases (overall intake range for studies reporting quantative exposure levels 0-645 g/d) were included for fatal and non-fatal CHD.

Comparing the highest category to the reference category of high-fat milk intake, no association between high-fat milk intake and risk of fatal and non-fatal CHD was observed (RR: 1.15; 95% CI 0.99 to 1.33, I^2 = 59%, $p_{heterogeneity}$ = 0.03). See figure 4_1_1.

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 200 g of high-fat milk were not associated with risk of fatal and non-fatal CHD (RR: 1.07; 95% CI 0.99 to 1.15, I^2 = 0%, $p_{heterogeneity}$ = 0.98, n = 3). See figure 4 _ 4 _ 1 . There was no evidence of a non-linear dose response association for fatal and non-fatal CHD ($p_{non\text{-}linearity}$ =0.96, n = 2).

Heterogeneity

A stratified analysis for heterogeneity of subgroup differences, in the high-vs-low metaanalysis for the relation between high-fat milk intake and fatal and non-fatal CHD showed no heterogeneity for sex ($p_{heterogeneity}$ = 0.53) and no heterogeneity for continent ($p_{heterogeneity}$ = 0.53). See figures 4_2_1[sex,continent].

A stratified analysis for heterogeneity of subgroup differences, in the dose-response metaanalysis for the relation between high-fat milk intake and fatal and non-fatal CHD showed no heterogeneity for sex ($p_{heterogeneity}$ = 0.8) and no heterogeneity for continent ($p_{heterogeneity}$ = 0.74). See figures 4_5_1[sex,continent].

Publication bias

There was found no evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal CHD (p_{Egger} = 0.54). See figure 4_3_1.

There was found no evidence of small study effects in the dose-response meta-analysis for fatal and non-fatal CHD (p_{Egger} = 0.56). See figure 4_6_1.

3.5 Yogurt products

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for yogurt products, 6 studies with 552342 participants and 14226 cases (overall intake range for studies reporting quantative exposure levels 0-400 g/d) were included for fatal and non-fatal CHD and 3 studies with 187281 participants and 6208 cases (overall intake range for studies reporting quantative exposure levels 0-400 g/d) were included for fatal and non-fatal ischemic stroke.

Comparing the highest category to the reference category of yogurt products intake, no association between yogurt products intake and risk of fatal and non-fatal CHD was observed (RR: 0.99; 95% CI 0.91 to 1.08, I^2 = 49%, $p_{heterogeneity}$ = 0.06), and no association between yogurt products intake and risk of fatal and non-fatal ischemic stroke was observed (RR: 1.04; 95% CI 0.95 to 1.13, I^2 = 0%, $p_{heterogeneity}$ = 0.42). See figures 5_1_1-5_1_2.

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 100 g of yogurt products were not associated with risk of fatal and non-fatal ischemic stroke (RR: 0.99; 95% CI 0.9 to 1.1, I^2 = 12%, $p_{heterogeneity}$ = 0.29, n = 2), and not associated with risk of fatal and non-fatal CHD (RR: 0.98; 95% CI 0.93 to 1.03, I^2 = 42%, $p_{heterogeneity}$ = 0.11, n = 5). See figures 5 _ 4 _[1,2]. There was no evidence of a non-linear dose response association for fatal and non-fatal CHD ($p_{non\text{-}linearity}$ =1, n = 3).

Heterogeneity

A stratified analysis for heterogeneity of subgroup differences, in the high-vs-low metaanalysis for the relation between yogurt products intake and fatal and non-fatal CHD showed no heterogeneity for sex ($p_{heterogeneity}$ = 0.97) and heterogeneity for continent ($p_{heterogeneity}$ = 0.05). See figures 5_2_1[sex,continent]. A stratified analysis for heterogeneity of subgroup differences, in the high-vs-low metaanalysis for the relation between yogurt products intake and fatal and non-fatal ischemic stroke showed no heterogeneity for sex ($p_{heterogeneity}$ = 0.22) and no heterogeneity for continent ($p_{heterogeneity}$ = 0.26). See figures 5_2_2[sex,continent].

A stratified analysis for heterogeneity of subgroup differences, in the dose-response metaanalysis for the relation between yogurt products intake and fatal and non-fatal CHD showed no heterogeneity for sex ($p_{heterogeneity}$ = 0.72) and heterogeneity for continent ($p_{heterogeneity}$ = 0.05). See figures 5_5_1[sex,continent]. A stratified analysis for heterogeneity of subgroup differences, in the dose-response metaanalysis for the relation between yogurt products intake and fatal and non-fatal ischemic stroke showed no heterogeneity for continent ($p_{heterogeneity}$ = 0.29). See figures 5_5_2[continent].

Publication bias

There was found evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal CHD (p_{Egger} <0.001), and no evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal ischemic stroke (p_{Egger} = 0.45). See figures 5_3_[1,2].

There was found no evidence of small study effects in the dose-response meta-analysis for fatal and non-fatal CHD (p_{Egger} = 0.14). See figure 5_6_1. Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal ischemic stroke.

3.6 Cheese

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for cheese, 7 studies with 554323 participants and 14698 cases (overall intake range for studies reporting quantative exposure levels 0-120 g/d) were included for fatal and non-fatal CHD and 3 studies with 187281 participants and 6208 cases (overall intake range for studies reporting quantative exposure levels 0-100 g/d) were included for fatal and non-fatal ischemic stroke.

Comparing the highest category to the reference category of cheese intake, inverse association between cheese intake and risk of fatal and non-fatal CHD was observed (RR: 0.91; 95% CI 0.84 to 0.99, I^2 = 37%, $p_{heterogeneity}$ = 0.12), and no association between cheese intake and risk of fatal and non-fatal ischemic stroke was observed (RR: 0.89; 95% CI 0.78 to 1.01, I^2 = 37%, $p_{heterogeneity}$ = 0.2). See figures 6_1_1-6_1_2.

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 20 g of cheese were inversely associated with risk of fatal and non-fatal CHD (RR: 0.96; 95% CI 0.93 to 0.98, I^2 = 3%, $p_{heterogeneity}$ = 0.41, n = 6), and not associated with risk of fatal and non-fatal ischemic stroke (RR: 0.96; 95% CI 0.91 to 1.01, I^2 = 67%, $p_{heterogeneity}$ = 0.05, n = 3). See figures 6 _ 4 _[1,2]. There was no evidence of a non-linear dose response association for fatal and non-fatal CHD ($p_{non\text{-}linearity}$ =0.82, n = 4), and fatal and non-fatal ischemic stroke ($p_{non\text{-}linearity}$ =0.6, n = 2).

Heterogeneity

A stratified analysis for heterogeneity of subgroup differences, in the high-vs-low metaanalysis for the relation between cheese intake and fatal and non-fatal CHD showed heterogeneity for sex ($p_{heterogeneity}$ = 0.03) and no heterogeneity for continent ($p_{heterogeneity}$ = 0.98). See figures 6_2_1[sex,continent]. A stratified analysis for heterogeneity of subgroup differences, in the high-vs-low metaanalysis for the relation between cheese intake and fatal and non-fatal ischemic stroke showed no heterogeneity for sex ($p_{heterogeneity}$ = 0.17) and no heterogeneity for continent ($p_{heterogeneity}$ = 0.11). See figures 6_2_2[sex,continent].

A stratified analysis for heterogeneity of subgroup differences, in the dose-response metaanalysis for the relation between cheese intake and fatal and non-fatal CHD showed no heterogeneity for sex ($p_{heterogeneity}$ = 0.55) and no heterogeneity for continent ($p_{heterogeneity}$ = 0.9). See figures 6_5_1[sex,continent]. A stratified

analysis for heterogeneity of subgroup differences, in the dose-response metaanalysis for the relation between cheese intake and fatal and non-fatal ischemic stroke showed no heterogeneity for sex ($p_{heterogeneity} = 0.14$) and no heterogeneity for continent ($p_{heterogeneity} = 0.09$). See figures 6_5_2[sex,continent].

Publication bias

There was found no evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal CHD ($p_{Egger} = 0.73$), and no evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal ischemic stroke ($p_{Egger} = 0.25$). See figures 6_3_[1,2].

There was found no evidence of small study effects in the dose-response meta-analysis for fatal and non-fatal CHD ($p_{Egger} = 0.77$), and no evidence of small study effects in the dose-response meta-analysis for fatal and non-fatal ischemic stroke ($p_{Egger} = 0.22$). See figures 6_6_[1,2].

3.7 Low-fat cheese

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for low-fat cheese 3 studies with 5081 cases (overall intake range for studies reporting quantative exposure levels 0-54 g/d) were included for fatal and non-fatal CHD.

Comparing the highest category to the reference category of low-fat cheese intake, no association between low-fat cheese intake and risk of fatal and non-fatal CHD was observed (RR: 1.17; 95% CI 0.85 to 1.61, $I^2 = 85\%$, $p_{heterogeneity} < 0.001$). See figure 7_1_1.

Dose-response meta-analysis

The linear dose response meta-analysis showed that each additional daily 20 g of low-fat cheese were not associated with risk of fatal and non-fatal CHD (RR: 1.24; 95% CI 0.76 to 2.04, $I^2 = 90\%$, $p_{heterogeneity} < 0.001$, n = 2). See figure 7 _ 4 _ 1 .

Heterogeneity

A stratified analysis for heterogeneity of subgroup differences, in the high-vs-low metaanalysis for the relation between low-fat cheese intake and fatal and non-fatal CHD showed no heterogeneity for sex ($p_{heterogeneity} = 0.53$) and no heterogeneity for continent ($p_{heterogeneity} = 0.33$). See figures 7_2_1[sex,continent].

A stratified analysis for heterogeneity of subgroup differences, in the dose-response metaanalysis for the relation between low-fat cheese intake and fatal and non-fatal CHD showed no heterogeneity for sex ($p_{heterogeneity} = 0.44$) and no heterogeneity for continent ($p_{heterogeneity} = 0.27$). See figures 7_5_1[sex,continent].

Publication bias

There was found no evidence of small study effects in the high-vs-low meta-analysis for fatal and non-fatal CHD ($p_{Egger} = 0.73$). See figure 7_3_1.

Egger's test for publication bias for the dose-response metaanalysis could not be performed for fatal and non-fatal CHD.

3.8 Low-fat yogurt products

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for low-fat yogurt products 2 studies with 4429 cases (overall intake range for studies reporting quantative exposure levels 0-200 g/d) were included for fatal and non-fatal CHD.

Comparing the highest category to the reference category of low-fat yogurt products intake, no association between low-fat yogurt products intake and risk of fatal and non-fatal CHD was observed (RR: 0.97; 95% CI 0.89 to 1.06, $I^2 = 0\%$, $p_{heterogeneity} = 0.83$). See figure 8_1_1.

Dose-response meta-analysis

Heterogeneity

Publication bias

Egger's test for publication bias for the high-vs-low metaanalysis could not be performed for fatal and non-fatal CHD.

3.9 High-fat yogurt products

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for high-fat yogurt products 2 studies with 5254 cases (overall intake range for studies reporting quantative exposure levels 0-200 g/d) were included for fatal and non-fatal CHD.

Comparing the highest category to the reference category of high-fat yogurt products intake, no association between high-fat yogurt products intake and risk of fatal and non-fatal CHD was observed (RR: 1.01; 95% CI 0.93 to 1.09, $I^2 = 0\%$, $p_{heterogeneity} = 0.64$). See figure 9_1_1.

Dose-response meta-analysis

Heterogeneity

Publication bias

Egger's test for publication bias for the high-vs-low metaanalysis could not be performed for fatal and non-fatal CHD.

3.10 High-fat cheese

High vs. low intake meta-analysis

In the high vs. low intake meta-analysis for high-fat cheese 2 studies with 5065 cases (overall intake range for studies reporting quantative exposure levels 0-80 g/d) were included for fatal and non-fatal CHD.

Comparing the highest category to the reference category of high-fat cheese intake, no association between high-fat cheese intake and risk of fatal and non-fatal CHD was observed (RR: 0.94; 95% CI 0.77 to 1.14, $I^2 = 71\%$, $p_{heterogeneity} = 0.06$). See figure 10_1_1.

Dose-response meta-analysis

Heterogeneity

Publication bias

Egger's test for publication bias for the high-vs-low metaanalysis could not be performed for fatal and non-fatal CHD.

3.11 Low-fat milk for high-fat milk

High vs. low intake meta-analysis

Dose-response meta-analysis

Heterogeneity

Publication bias

3.12 Low-fat yogurt products for high-fat yogurt products

High vs. low intake meta-analysis

Dose-response meta-analysis

Heterogeneity

Publication bias

3.13 Low-fat yogurt products for low-fat milk

High vs. low intake meta-analysis

Dose-response meta-analysis

Heterogeneity

Publication bias

3.14 Low-fat yogurt products for high-fat milk

High vs. low intake meta-analysis

Dose-response meta-analysis

Heterogeneity

Publication bias

3.15 High-fat yogurt products for low-fat milk

High vs. low intake meta-analysis

Dose-response meta-analysis

Heterogeneity

Publication bias

3.16 High-fat yogurt products for high-fat milk

High vs. low intake meta-analysis

Dose-response meta-analysis

Heterogeneity

Publication bias

3.17 Cheese for low-fat milk

High vs. low intake meta-analysis

Dose-response meta-analysis

Heterogeneity

Publication bias

3.18 Cheese for high-fat milk

High vs. low intake meta-analysis

Dose-response meta-analysis

Heterogeneity

Publication bias

3.19 Cheese for low-fat yogurt products

High vs. low intake meta-analysis

Dose-response meta-analysis

Heterogeneity

Publication bias

3.20 Cheese for high-fat yogurt products

High vs. low intake meta-analysis

Dose-response meta-analysis

Heterogeneity

Publication bias

3.21 Cheese for butter

High vs. low intake meta-analysis

Dose-response meta-analysis

Heterogeneity

Publication bias

3.22 Low-fat yogurt products for butter

High vs. low intake meta-analysis

Dose-response meta-analysis

Heterogeneity

Publication bias

3.23 High-fat yogurt products for butter

High vs. low intake meta-analysis

Dose-response meta-analysis

Heterogeneity

Publication bias

3.24 Low-fat milk for butter

High vs. low intake meta-analysis

Dose-response meta-analysis

Heterogeneity

Publication bias

3.25 High-fat milk for butter

High vs. low intake meta-analysis

Dose-response meta-analysis

Heterogeneity

Publication bias