**Supplementary Material S4** NutriGrade scoring tool.

This supplement provides an overview of the applied NutriGrade scoring system. Detailed guidance and information on the allocation of points can be found here: Schwingshackl L, Knüppel S, Schwedhelm C, Hoffmann G, Missbach B, Stelmach-Mardas M, Dietrich S, Eichelmann F, Kontopanteils E, Iqbal K, Aleksandrova K, Lorkowski S, Leitzmann MF, Kroke A, Boeing H: Perspective: NutriGrade: A scoring system to assess and judge the meta-evidence of randomized controlled trials and cohort studies in nutrition research. Adv Nutr 2016;7:994–1004.

**NutriGrade scoring system for SRs with MA of RCTs**

1. Risk of bias/ study quality/ study limitations **(3 P)**
   1. No quantitative and descriptive information available(0 P)
   2. Risk of bias (3 P)
      1. Sequence generation1
      2. Allocation concealment1
      3. Blinding of participants and personnel1
      4. Blinding of outcome assessment personnel1
      5. Incomplete outcome1
      6. Selective reporting1
   3. Study quality (2 P)2
2. Precision **(1 P)**
   1. <400 participants OR 400-2000 participants, but 95% CI overlaps the null value (0 P)
   2. >2000 participants OR 400-2000 participants, but 95% CI excludes the null value (1 P)
3. Heterogeneity **(1 P)**
   1. ≤ 5 studies (0 P)
   2. 6-9 studies (if ≥10 studies; multiply points by 2):
      1. I2 (H2 and/or tau2) (0.1 P)
      2. CIs for I2 (0.1 P)
      3. If I2 <40% (0.3 P) skip **iv**
      4. Modelling detected heterogeneity (I2≥40%) with random effects model (0.1 P)
         1. Exploring detected heterogeneity with subgroup analysis or meta-regression (0.1 P)
         2. Sensitivity analyses with higher levels of heterogeneity (0.1 P)
4. Directness **(1 P)**
   1. Differences in population; differences in intervention; surrogate markers; network meta-analysis (0 P)
   2. No important differences in population or intervention; hard clinical outcome (1 P)
5. Publication bias **(1 P)**
   1. <5 studies OR evidence for severe bias with test or plot OR publication bias not assessed(0 P)
   2. No evidence for publication bias with test or plot (5-9 studies) OR evidence for moderate/small amount of publication bias with test or plot (0.5 P)
   3. No evidence for publication bias with test or plot (≥10 studies) (1 P)

Funding bias **(1 P)**

* 1. Industry funding OR conflict of interest (0 P)
  2. Private institutions, foundations, non-governmental organizations (0.5 P)
  3. Academic institutions, research institutions (1 P)

**2**

1. Study design **(+ 2 P)**

**Overall Score**3

P: point(s); RCT: randomized controlled trial.

1 ≥2/3 of studies low risk of bias = 0.5 P; >1/3 of studies high risk of bias OR not assessed = 0 P; unclear risk of bias = 0.25P)

2 ≥2/3 of overall score = 2 P; ≥1/3 of overall score = 1 P; otherwise = 0 P

3 0-3.99: very low evidence; 4-5.99: low evidence; 6-7.99: moderate evidence; ≥8: high evidence

**NutriGrade scoring system for SRs with MA of cohort studies**

1. Risk of bias/ study quality/ study limitations **(2 P)**
   1. No information available (0 P)
   2. Risk of bias (2 P)
      1. Ascertainment of exposure1
      2. Adjusted basic & outcome relevant model1
      3. Assessment of outcome1
      4. Adequacy of follow-up duration1
   3. Study quality (2 P)2
2. Precision **(1 P)**
   1. <500 events OR ≥500 events but 95% CI overlaps the null, and includes important benefit (RR: <0.8) or harm (RR: >1.2) (0 P)
   2. ≥500 events and the 95% CI excludes the null values; ≥500 events but 95% CI overlaps the null, and excludes important benefit (RR: <0.8) or harm (RR: >1.2) (1 P)
3. Heterogeneity **(1 P)**
   1. ≤ 5 studies (0 P)
   2. 6-9 studies (if ≥10 studies; multiply by 2):
      1. I2 (H2 and/or tau2) (0.1 P)
      2. CIs for I2 (0.1 P)
      3. If I2 <40% (0.3 P) skip iv
      4. Modelling detected heterogeneity (I2 ≥40%) with random effects model (0.1 P)
         1. Exploring detected heterogeneity with subgroup analysis or meta-regression (0.1 P)
         2. Sensitivity analyses with higher levels of heterogeneity (0.1 P)
4. Directness **(1 P)**
   1. Differences in population; differences in intervention; surrogate markers; network meta-analysis (0 P)
   2. No important differences in population or intervention; hard clinical outcome (1 P)
5. Publication bias **(1 P)**
   1. <5 studies OR evidence for severe bias with test or plot OR publication bias not assessed(0 P)
   2. No evidence for publication bias with test or plot (5-9 studies) OR evidence for moderate/small amount of publication bias with test or plot (0.5 P)
   3. No evidence for publication bias with test or plot (≥10 studies) (1 P)
6. Funding bias **(1 P)**
   1. Industry funding OR conflict of interest (0 P)
   2. Private institutions, foundations, non-governmental organizations (0.5 P)
   3. Academic institutions, research institutions (1 P)
7. Effect size **(2 P)**
   1. No effect (HR/RR: 0.80-1.20) (0 P)
   2. Moderate effect size (HR/RR: <0.80-0.50 or >1.2-2.00) (1 P)
   3. Large effect size (HR/RR: <0.50 or >2.00) (2 P)
8. Dose-response **(1 P)**
   1. No dose-response relationship (corresponding statistical test non- significant) (0 P)
   2. Linear and/ or non-linear dose-response relationship (corresponding statistical test significant) (1 P)

**Overall Score**3

P: point(s); RR: risk ratio.

1 ≥2/3 of studies low risk of bias = 0.5 P; >1/3 of studies high risk of bias OR not assessed = 0 P; unclear risk of bias = 0.25 P)

2 cut-off for different quality scale (≥3/4 of overall score= 2 P; ≥1/2 of overall score= 1 P; <1/2 of overall score= 0 P); i.e. **Newcastle-Ottawa Scale** (mean): ≥7= 2 P; 4-6.9= 1 P; 0-3.9= 0 P;

3 0-3.99: very low evidence; 4-5.99: low evidence; 6-7.99: moderate evidence; ≥8: high evidence

**NutriGrade scoring system for SRs without MA of RCTs**

1. Risk of bias/ study quality/ study limitations **(3 P)**
   1. No quantitative and descriptive information available(0 P)
   2. Risk of bias (3 P)
      1. Sequence generation1
      2. Allocation concealment1
      3. Blinding of participants and personnel1
      4. Blinding of outcome assessment personnel1
      5. Incomplete outcome1
      6. Selective reporting1
   3. Study quality (2 P)2
2. Precision **(1 P)**
   1. <400 participants (0 P)
   2. ≥400 participants (1 P)
3. Heterogeneity **(1 P)**
   1. >1/3 of included studies have an inconsistent result (i.e. point estimates and/or 95% CI did not overlap between studies) (0 P)
   2. ≥2/3 of included studies have a consistent result (i.e. point estimates and/or 95% CI did overlap between studies) (1 P)
4. Directness **(1 P)**
   1. Differences in population; differences in intervention; surrogate markers; network meta-analysis (0 P)
   2. No important differences in population or intervention; hard clinical outcome (1 P)
5. Funding bias **(1 P)**
   1. Industry funding OR conflict of interest (0 P)
   2. Private institutions, foundations, non-governmental organizations (0.5 P)
   3. Academic institutions, research institutions (1 P)

**2**

1. Study design **(+ 2 P)**

**Overall Score**3

95% CI: confidence intervals; P: point(s); RCT: randomized controlled trial.

1 ≥2/3 of studies low risk of bias = 0.5 P; >1/3 of studies high risk of bias OR not assessed = 0 P; unclear risk of bias = 0.25P)

2 ≥2/3 of overall score = 2 P; ≥1/3 of overall score = 1 P; otherwise = 0 P

3 0-3.49: very low evidence; 3.5-5.49: low evidence; 5.5-6.99: moderate evidence; ≥7: high evidence

**NutriGrade scoring system for SRs without MA of cohort studies**

1. Risk of bias/ study quality/ study limitations **(2 P)**
   1. No information available (0 P)
   2. Risk of bias (2 P)
      1. Ascertainment of exposure1
      2. Adjusted basic & outcome relevant model1
      3. Assessment of outcome1
      4. Adequacy of follow-up duration1
   3. Study quality (2 P)2
2. Precision **(1 P)**
   1. <500 Events or <2000 participants events (0 P)
   2. ≥500 Events or ≥2000 participants events (1 P)
3. Heterogeneity **(1 P)**
   1. >1/3 of included studies have an inconsistent result (i.e. point estimates and/or 95% CI did not overlap between studies) (0 P)
   2. ≥2/3 of included studies have a consistent result (i.e. point estimates and/or 95% CI did overlap between studies) (1 P)
4. Directness **(1 P)**
   1. Differences in population; differences in intervention; surrogate markers; network meta-analysis (0 P)
   2. No important differences in population or intervention; hard clinical outcome (1 P)
5. Funding bias **(1 P)**
   1. Industry funding OR conflict of interest (0 P)
   2. Private institutions, foundations, non-governmental organizations (0.5 P)
   3. Academic institutions, research institutions (1 P)
6. Effect size **(2 P)**
   1. No effect for >1/3 of included studies (0 P)
   2. Moderate effect size for ≥2/3 of included studies (1 P)
   3. Large effect size for ≥2/3 of included studies (2 P)

**Overall Score**3

95% CI: confidence intervals; P: point(s); RR: risk ratio.

1 ≥2/3 of studies low risk of bias = 0.5 P; >1/3 of studies high risk of bias OR not assessed = 0 P; unclear risk of bias = 0.25 P)

2 cut-off for different quality scale (≥3/4 of overall score= 2 P; ≥1/2 of overall score= 1 P; <1/2 of overall score= 0 P); i.e. **Newcastle-Ottawa Scale** (mean): ≥7= 2 P; 4-6.9= 1 P; 0-3.9= 0 P;

3 0-2.99: very low evidence; 3-4.49: low evidence; 4.5-5.99: moderate evidence; ≥6: high evidence