

Supplementary Material for Research Article :

Estimated dietary pesticide exposure from plant-based foods using NMF-derived profiles in a large sample of French adults

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Supplemental table 1: Descriptive statistics for the estimated daily intake (EDI) (in µg/kg bw/d) for pesticide exposure by cluster, lower-bound scenario, NutriNet-Santé study, 2014 (n=34,193)

Variable	Whole population (n=34,193)	Cluster 1 (50.70%) ¹	Cluster 2 (27.58%) ¹	Cluster 3 (2.20%) ¹	Cluster 4 (8.27%) ¹	Cluster 5 (11.20%) ¹	Cluster 6 ² (0.05%) ¹
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Acetamiprid	0.0446 (0.0605)	0.0244 (0.0284)	0.0432 (0.0413)	0.0890 (0.0973)	0.1315 (0.1068)	0.0657 (0.0683)	0.1302 (0.0893)
Anthraquinone	0.0005 (0.0014)	0.0005 (0.0014)	0.0006 (0.0013)	0.0006 (0.0020)	0.0005 (0.0012)	0.0006 (0.0015)	0.0004 (0.0010)
Azadirachtin	0.0003 (0.0004)	0.0003 (0.0004)	0.0003 (0.0004)	0.0004 (0.0005)	0.0006 (0.0007)	0.0003 (0.0004)	0.0005 (0.0008)
Azoxystrobin	0.0443 (0.0530)	0.0254 (0.0211)	0.0588 (0.0472)	0.1478 (0.1856)	0.0333 (0.0278)	0.0812 (0.0636)	0.2842 (0.4802)
Boscalid	0.1128 (0.1095)	0.0726 (0.0567)	0.1454 (0.1314)	0.2849 (0.2113)	0.1005 (0.0749)	0.1877 (0.1252)	0.4849 (0.2533)
Carbendazim	0.0439 (0.0463)	0.0274 (0.0237)	0.0436 (0.0332)	0.0838 (0.0727)	0.1095 (0.0762)	0.0628 (0.0518)	0.1213 (0.0647)
Chlorpropham	0.0666 (0.0740)	0.0559 (0.0615)	0.0812 (0.0853)	0.1065 (0.1640)	0.0460 (0.0484)	0.0868 (0.0742)	0.0901 (0.0480)
Chlorpyrifos	0.0629 (0.0587)	0.0312 (0.0278)	0.0705 (0.0342)	0.2323 (0.0831)	0.0931 (0.0612)	0.1299 (0.0506)	0.7237 (0.1796)
Cypermethrin	0.0654 (0.0859)	0.0371 (0.0415)	0.0611 (0.0556)	0.1285 (0.1350)	0.1957 (0.1499)	0.0946 (0.0966)	0.1919 (0.1166)
Cyprodinil	0.0699 (0.0803)	0.0433 (0.0375)	0.0917 (0.0987)	0.1830 (0.1709)	0.0600 (0.0507)	0.1208 (0.1019)	0.2864 (0.1758)
Difenoconazole	0.0157 (0.0156)	0.0099 (0.0100)	0.0190 (0.0175)	0.0380 (0.0285)	0.0205 (0.0145)	0.0253 (0.0163)	0.0673 (0.0355)
Dimethoate Ometoate	0.0080 (0.0113)	0.0043 (0.0050)	0.0084 (0.0122)	0.0195 (0.0212)	0.0200 (0.0156)	0.0126 (0.0126)	0.0300 (0.0148)
Fenhexamid	0.0943 (0.1435)	0.0527 (0.0689)	0.1296 (0.1786)	0.2834 (0.3294)	0.0794 (0.0952)	0.1687 (0.1855)	0.2217 (0.1324)
Glyphosate	0.0036 (0.0052)	0.0029 (0.0045)	0.0042 (0.0054)	0.0074 (0.0132)	0.0033 (0.0041)	0.0050 (0.0055)	0.0104 (0.0060)
Imazalil	0.7531 (0.9396)	0.2427 (0.1775)	0.9272 (0.2856)	4.3220 (1.3986)	0.4090 (0.3212)	2.1222 (0.5169)	16.6824 (4.6743)
Imidacloprid	0.0778 (0.0743)	0.0443 (0.0434)	0.0985 (0.0677)	0.1854 (0.1494)	0.1071 (0.0690)	0.1357 (0.0962)	0.1943 (0.0757)
Iprodione	0.1317 (0.1657)	0.0744 (0.0758)	0.1770 (0.1936)	0.3807 (0.3628)	0.1118 (0.1061)	0.2412 (0.2084)	1.0611 (1.0110)
Malathion	0.0003 (0.0004)	0.0002 (0.0002)	0.0004 (0.0003)	0.0011 (0.0017)	0.0003 (0.0004)	0.0006 (0.0004)	0.0033 (0.0012)
Methamidophos	0.0003 (0.0003)	0.0002 (0.0003)	0.0003 (0.0004)	0.0004 (0.0004)	0.0002 (0.0003)	0.0003 (0.0004)	0.0002 (0.0003)
Profenofos	0.0000 (0.0000)	0.0000 (0.0000)	0.0001 (0.0000)	0.0002 (0.0001)	0.0000 (0.0000)	0.0001 (0.0000)	0.0007 (0.0002)
Pyrethrins	0.0022 (0.0021)	0.0021 (0.0020)	0.0023 (0.0020)	0.0024 (0.0030)	0.0028 (0.0021)	0.0024 (0.0023)	0.0012 (0.0014)
Spinosad	0.1265 (0.1659)	0.0927 (0.1020)	0.0928 (0.0950)	0.1569 (0.2421)	0.4442 (0.2579)	0.1208 (0.1559)	0.2679 (0.2807)
Tebuconazole	0.0327 (0.0431)	0.0186 (0.0189)	0.0436 (0.0525)	0.0980 (0.0977)	0.0278 (0.0269)	0.0603 (0.0530)	0.2366 (0.2066)
Thiabendazole	0.2753 (0.3114)	0.0983 (0.0701)	0.3585 (0.1189)	1.4149 (0.6059)	0.1582 (0.1200)	0.7166 (0.1675)	4.6185 (1.3723)
Lambda Cyhalothrin	0.0098 (0.0101)	0.0060 (0.0054)	0.0124 (0.0112)	0.0274 (0.0194)	0.0093 (0.0077)	0.0172 (0.0121)	0.0657 (0.0385)

¹ : Weighted percent of whole sample

² : The results for this group should be treated with caution as the small sample size can lead to unreliable estimates

SD : Standard Deviation

Supplemental table 2: Descriptive statistics for the estimated daily intake (EDI) (in µg/kg bw/d) for pesticide exposure by cluster, upper-bound scenario, NutriNet-Santé study, 2014 (n=34,193)

	Whole population (n=34,193)	Cluster 1 (50.70%)¹	Cluster 2 (27.58%)¹	Cluster 3 (2.20%)¹	Cluster 4 (8.27%)¹	Cluster 5 (11.20%)¹	Cluster 6² (0.05%)¹
Variable	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Acetamiprid	0.071 (0.068)	0.048 (0.034)	0.069 (0.047)	0.129 (0.107)	0.175 (0.112)	0.096 (0.076)	0.190 (0.102)
Anthraquinone	0.064 (0.034)	0.051 (0.025)	0.069 (0.029)	0.122 (0.051)	0.082 (0.038)	0.086 (0.033)	0.235 (0.101)
Azadirachtin	0.070 (0.046)	0.059 (0.039)	0.067 (0.037)	0.106 (0.057)	0.126 (0.056)	0.081 (0.045)	0.156 (0.052)
Azoxystrobin	0.110 (0.072)	0.081 (0.043)	0.121 (0.062)	0.243 (0.193)	0.154 (0.066)	0.155 (0.080)	0.417 (0.472)
Boscalid	0.142 (0.114)	0.097 (0.059)	0.174 (0.135)	0.329 (0.215)	0.153 (0.081)	0.221 (0.131)	0.551 (0.269)
Carbendazim	0.071 (0.056)	0.050 (0.032)	0.069 (0.041)	0.124 (0.084)	0.153 (0.083)	0.093 (0.061)	0.181 (0.077)
Chlorpropham	0.098 (0.076)	0.082 (0.062)	0.112 (0.087)	0.155 (0.164)	0.101 (0.054)	0.123 (0.076)	0.163 (0.053)
Chlorpyrifos	0.077 (0.062)	0.043 (0.030)	0.084 (0.037)	0.252 (0.088)	0.118 (0.066)	0.146 (0.055)	0.749 (0.181)
Cypermethrin	0.095 (0.094)	0.064 (0.052)	0.090 (0.063)	0.171 (0.140)	0.241 (0.150)	0.126 (0.102)	0.253 (0.123)
Cyprodinil	0.100 (0.086)	0.069 (0.042)	0.121 (0.103)	0.229 (0.174)	0.114 (0.059)	0.156 (0.107)	0.356 (0.192)
Difenoconazole	0.046 (0.030)	0.035 (0.020)	0.048 (0.027)	0.084 (0.045)	0.080 (0.035)	0.061 (0.032)	0.133 (0.051)
Dimethoate Ometoate	0.023 (0.017)	0.017 (0.010)	0.023 (0.017)	0.044 (0.028)	0.044 (0.020)	0.030 (0.018)	0.068 (0.024)
Fenhexamid	0.172 (0.158)	0.118 (0.082)	0.205 (0.188)	0.403 (0.341)	0.215 (0.116)	0.259 (0.198)	0.401 (0.176)
Glyphosate	0.157 (0.084)	0.123 (0.064)	0.162 (0.070)	0.286 (0.117)	0.245 (0.086)	0.203 (0.082)	0.516 (0.206)
Imazalil	0.821 (0.946)	0.301 (0.178)	0.992 (0.287)	4.419 (1.404)	0.534 (0.332)	2.198 (0.522)	16.809 (4.666)
Imidacloprid	0.143 (0.091)	0.101 (0.060)	0.161 (0.076)	0.280 (0.157)	0.213 (0.091)	0.208 (0.105)	0.336 (0.094)
Iprodione	0.202 (0.180)	0.134 (0.087)	0.244 (0.205)	0.486 (0.372)	0.238 (0.126)	0.322 (0.223)	1.211 (1.042)
Malathion	0.080 (0.048)	0.066 (0.041)	0.078 (0.038)	0.123 (0.060)	0.137 (0.057)	0.093 (0.046)	0.185 (0.059)
Methamidophos	0.080 (0.048)	0.066 (0.041)	0.077 (0.038)	0.123 (0.060)	0.137 (0.057)	0.093 (0.046)	0.183 (0.058)
Profenofos	0.029 (0.019)	0.025 (0.016)	0.028 (0.015)	0.045 (0.023)	0.052 (0.023)	0.034 (0.018)	0.067 (0.022)
Pyrethrins	0.627 (0.420)	0.527 (0.361)	0.597 (0.333)	0.930 (0.522)	1.139 (0.523)	0.714 (0.404)	1.295 (0.428)
Spinosad	0.195 (0.189)	0.150 (0.121)	0.158 (0.114)	0.258 (0.265)	0.565 (0.267)	0.198 (0.181)	0.413 (0.307)
Tebuconazole	0.085 (0.065)	0.061 (0.041)	0.092 (0.066)	0.180 (0.115)	0.138 (0.063)	0.120 (0.072)	0.355 (0.232)
Thiabendazole	0.330 (0.319)	0.142 (0.075)	0.409 (0.120)	1.499 (0.608)	0.271 (0.137)	0.779 (0.171)	4.739 (1.378)
Lambda Cyhalothrin	0.088 (0.051)	0.071 (0.042)	0.088 (0.043)	0.147 (0.067)	0.145 (0.059)	0.108 (0.051)	0.241 (0.086)

¹ : Weighted percent of whole sample

² : The results for this group should be treated with caution as the small sample size can lead to unreliable estimates

SD : Standard Deviation

Supplemental Table 3 : Descriptive statistics for the 16 food groups by cluster, NutriNet-Santé study, 2014 (n=34,193)

	Cluster 1 (50.70%) ¹	Cluster 2 (27.58%) ¹	Cluster 3 (2.20%) ¹	Cluster 4 (8.27%) ¹	Cluster 5 (11.20%) ¹	Cluster 6² (0.05%) ¹
Variable	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Alcoholic beverages	92.18 (148.83)	93.28 (138.86)	72.24 (172.22)	83.00 (104.76)	81.08 (181.10)	31.57 (58.79)
Other fats (including mayonnaise, fresh cream, vegetable fresh cream)	3.56 (5.10)	3.69 (6.16)	3.66 (5.47)	3.68 (4.58)	3.38 (4.74)	2.01 (3.75)
Non-alcoholic drinks	1654.96 (777.87)	1732.08 (774.72)	1918.62 (892.23)	2090.30 (849.45)	1800.41 (856.69)	1994.79 (660.77)
Butter	6.58 (7.28)	6.88 (7.15)	5.81 (6.91)	5.81 (5.94)	6.65 (6.61)	4.31 (3.24)
Whole-grain products	52.08 (70.84)	48.02 (63.88)	51.77 (75.17)	69.14 (70.95)	50.10 (68.76)	85.43 (6.01)
Extra food (including snacks, chips, salted biscuits, dressing and sauces)	16.96 (17.79)	17.23 (16.87)	21.84 (23.76)	18.13 (15.08)	17.74 (17.13)	16.11 (15.63)
Fruit and vegetables (including juices and soups)	549.37 (334.46)	812.18 (408.29)	1392.57 (645.48)	904.01 (477.07)	1006.53 (452.89)	3167.38 (1561.14)
Starchy foods	177.83 (116.12)	184.93 (114.70)	185.59 (132.42)	166.96 (100.54)	175.29 (110.11)	134.95 (65.93)
Oil	17.96 (15.47)	19.12 (15.84)	23.17 (21.24)	24.67 (16.68)	20.22 (17.16)	18.50 (11.35)
Sweetened foods	70.45 (57.89)	75.74 (62.16)	69.55 (71.74)	62.40 (54.08)	73.47 (55.44)	74.50 (76.70)
Fast food	34.97 (47.09)	35.16 (34.58)	27.98 (32.14)	27.81 (24.61)	33.22 (34.15)	17.38 (27.31)
Seafood	39.37 (44.26)	45.94 (43.43)	53.43 (56.93)	45.85 (36.72)	47.15 (45.32)	25.75 (20.63)
Dairy products	241.88 (215.65)	292.38 (229.93)	303.22 (271.26)	237.17 (199.71)	307.26 (231.87)	479.46 (382.97)
Eggs	10.62 (12.43)	11.95 (13.65)	13.19 (13.69)	11.66 (11.44)	12.65(14.37)	15.27 (17.25)
Soy-based products	34.63 (104.72)	23.66 (78.86)	37.64 (102.57)	54.20 (134.07)	33.75 (105.81)	59.64 (174.30)
Meat, poultry, processed meats	114.43 (91.57)	127.98 (93.05)	101.37 (87.61)	95.89 (67.06)	121.44 (86.59)	65.48 (91.02)
Percentage of organic food for 16 food groups (%)						
Alcoholic beverages	16.76 (24.25)	10.11 (17.22)	6.58 (16.42)	20.37 (23.29)	7.50 (15.68)	0.62 (4.12)
Other fats (including mayonnaise, fresh cream, vegetable fresh cream)	27.96 (36.18)	16.47 (27.09)	12.38 (27.34)	35.04 (34.89)	13.22 (26.16)	11.68 (31.56)
Non-alcoholic drinks	13.37 (18.26)	8.18 (13.41)	8.50 (15.52)	17.07 (17.46)	6.84 (12.22)	2.27 (4.73)
Butter	29.12 (37.48)	17.74 (28.51)	10.89 (25.96)	32.42 (34.72)	14.21 (27.19)	14.45 (14.85)
Whole-grain	33.43 (38.03)	21.62 (30.06)	17.20 (30.08)	42.34 (35.80)	18.41 (29.32)	16.95 (31.51)

products						
Extra food (including snacks, chips, salted biscuits, dressing and sauces)	25.09 (31.45)	13.58 (21.48)	10.87 (23.25)	32.81 (30.76)	11.76 (21.15)	9.15 (21.30)
Fruit and vegetables (including juices and soups)	38.62 (33.11)	21.17 (21.85)	13.20 (17.92)	51.59 (29.34)	15.85 (19.59)	9.75 (16.92)
Starchy foods	31.48 (33.01)	19.08 (23.23)	16.67 (24.61)	42.27 (31.13)	15.83 (22.33)	40.32 (33.88)
Oil	40.74 (39.61)	26.64 (32.93)	21.80 (33.93)	49.52 (35.75)	22.04 (32.26)	9.13 (25.58)
Sweetened foods	27.23 (28.84)	16.49 (20.54)	15.07 (21.67)	36.43 (27.80)	15.37 (21.81)	18.19 (16.68)
Fast food	20.05 (28.02)	11.11 (19.26)	6.36 (16.70)	25.11 (27.89)	9.49 (18.63)	8.56 (21.91)
Seafood	16.83 (25.49)	11.51 (19.94)	6.82 (17.13)	19.33 (23.55)	9.00 (18.23)	1.08 (4.88)
Dairy products	28.56 (33.19)	17.75 (24.75)	11.57 (23.69)	32.96 (30.90)	14.95 (23.89)	6.67 (13.02)
Eggs	52.51 (41.46)	42.95 (39.65)	32.10 (39.73)	62.18 (36.17)	36.85 (39.31)	45.17 (50.02)
Soy-based products	29.64 (43.11)	19.23 (35.55)	21.61 (38.23)	38.42 (40.96)	17.84 (35.23)	54.44 (46.51)
Meat, poultry, processed meats	22.69 (27.19)	14.76 (19.60)	8.76 (16.61)	27.68 (26.13)	11.49 (18.20)	3.57 (9.02)

¹ : Weighted percent of whole sample

² : The results for this group should be treated with caution as the small sample size can lead to unreliable estimates

/ SD : Standard Deviation