Supplementary Online Content

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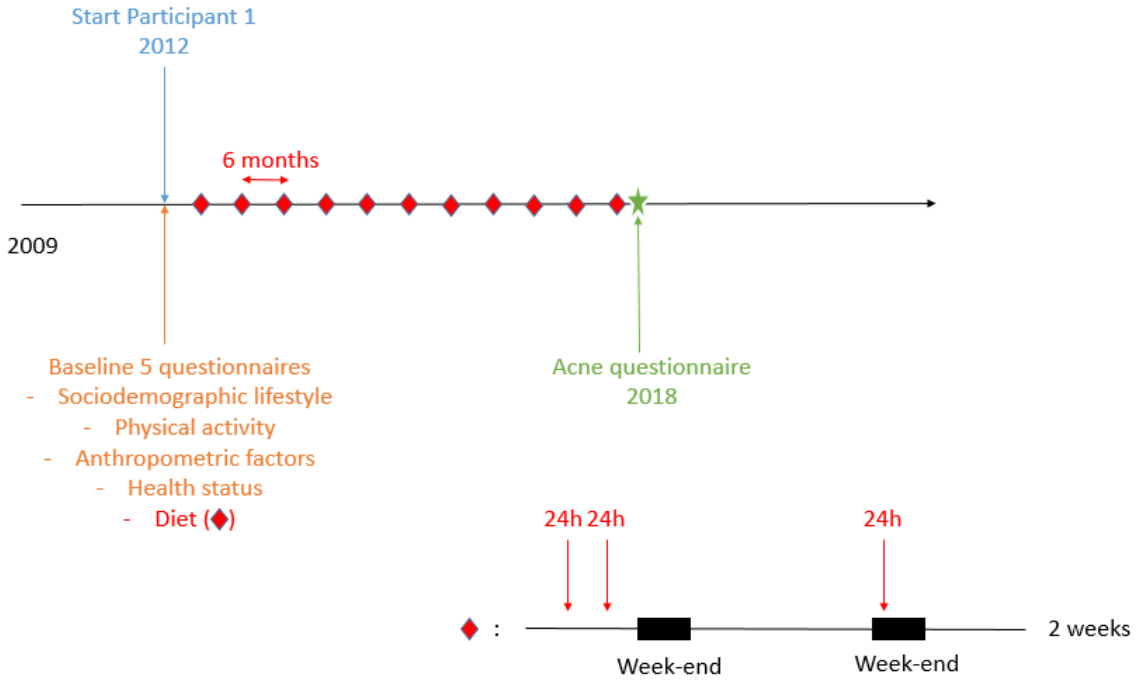
This supplementary material has been provided by the authors to give readers additional information about their work.

eMethods. Methods Details

The Nutri-Net-Santé study is an ongoing, observational, web-based cohort, which aims to study the associations between nutrition and health. The cohort was launched in May 2009 by means of vast multimedia campaigns and recruited adults among the general population. Due to its design, participants are eligible if they have access to the internet where they can complete online self-questionnaires using a dedicated secure website (https://www.etude-nutrinet-sante.fr/). At baseline participants were asked to complete a set of 5 questionnaires regarding their diet, sociodemographic lifestyle (eg, sex, date of birth, educational level, smoking status), physical activity (7-day International Physical Activity Questionnaire [IPAQ]), anthropometric factors (eg, height, weight) and their health status. Inclusion in the cohort was completed at the end of the completion of this set of questionnaires. The same set of questionnaires was completed each year thereafter. In addition, participants were invited to fill each month complementary optional questionnaires related to determinants of dietary behavior and nutritional and health status. Finally, at inclusion and twice a year thereafter, participants were also invited to complete three nonconsecutive 24-h dietary records, which were randomly assigned over a 2-week period (two weekdays and one week-end day). Follow-up is insured by the online platform connected to their email address where they receive information about the study and questionnaire recalls. More details of the Nutri-Net-Santé study's rationale, design, and procedures have been previously published[1].[2–4]

eFigure. Nutri-Net-Santé Design



To illustrate how the variables were collected, we will take the example of Participant 1 which started the Nutri-Net-Santé e-cohort in 2012. At baseline Participant 1 had to complete a set of 5 questionnaires about his/her diet, sociodemographic lifestyle (eg, sex, date of birth, educational level, smoking status), physical activity (7-day International Physical Activity Questionnaire [IPAQ]), anthropometric factors (eg, height, weight) and his/her health status. Therefore, all these questionnaires have been completed in 2012, at the index date. The package of dietary records was proposed every 6 months, and was composed by three 24-hour dietary records randomly assigned over a two-week period (two weekdays and 1 weekend day). Since the acne questionnaire was administrated in 2018, Participant 1 had at least 12 (depending on the month he started) dietary record completed between his first-inclusion and the acne questionnaire. To be included in our cross-sectional study, Participant had to complete the acne questionnaire and had at least 3 pack of dietary records available before the acne questionnaire to have a minimum time of exposure of 1 year. The food/nutrient exposure was collected for each participant as the mean daily intake for each food and each nutrient. The mean daily energy intake was calculated and the number of dietary records was collected for adjustment.

eTable 1. Optional acne questionnaire sent to the NutriNet cohort in November 2018	
Questions	Response options
Do you (or did you) current acne?	Yes/No
Your acne was diagnosed by:	A dermatologist / Your general practitioner / Another physician or surgeon / Another healthcare professional (pharmacist, nurse, physiotherapist, midwife, naturopath, homeopathic practitioner, etc.) / Yourself (self-diagnosis) / Don't know
When did your acne appeared for the first time (approximately)?	Before the age of 10 / Between 10 and 15 / 16 or 17 / After 18 years old / Don't know
Did you consult for your acne?	Your general practitioner / A dermatologist in a consulting firm or in a private clinic / A health professional (pharmacist, nurse, physiotherapist, midwife, naturopath, homeopathic practitioner…) / Don't know
Have you been hospitalised for your acne?	Yes / No / Don't know
If so, how long after the appearance of acne were you hospitalized?	1 year later / 2 years later /3 years later / 4 years later / Don't know

What types of treatment (if any) did you receive? (tick all that apply):	A cream or balm / tablets / injections / phototherapy (UV therapy administered by a physician) / Acupuncture, homeopathy, mesotherapy or another type of alternative medicine / Don't know
Is your acne present at the moment?	Yes / No / Don't know
If it is no longer present, how old were you when your acne disappeared (approximately)?	Between 10 and 15 / 16 or 17 / 18 or over / Don't know
At the moment, how would you rate the severity of your acne?	Not at all severe / Mild / Moderate / Severe / Don't know
What impact does acne have on your daily life today	No impact / Slight impact / Moderate impact / Major or very major impact / Don't know
Do you think that your diet has or had an impact on your acne?	Yes / No / Don't know

eTable 2. Acne status of the study population				
	Participants with past or current acne n=11,324 (46%)		Missing data	
	N	%	N	%
Diagnosed by a dermatologist	4,200	37	284	3
Diagnosed by a physician other than a dermatologist	1,830	16		
Diagnosed by another healthcare professional	79	1		
Self-diagnosis	4,931	44		
Age at onset			254	2
Before 10	90	1		
Between 10 and 15	7,087	63		
16 or 17	3,109	27		
18 or over	784	7		
Previous hospitalization for acne	18	0	20	0
Treatments with creams or balms	9,822	87	3800	34
Systemic treatments	3,491	31	3800	34

Other treatments: alternative medicine	606	5	3800	34
Acne present when the questionnaire was filled out	1762	16	130	1
Diet considered to have an impact on acne	3576	32	4195	37
Age at resolution (in the "past acne" group, n=9562)			465	5
Between 10 and 15	256	3		
16 or 17	2310	24		
18 or over	6531	68		
Abbreviations: N = number of participants; % = percentage				

eTable 3. Univariate analyses of dietary patterns from a PCA analysis of the study population, using a multinomial logistic regression

	Univariate analyses (vs. never acne) n=13,128 (54%)							
	Past acne n=9,562 (39%)				Current acne n=1,762 (7%)			
	OR	95CI%		p-value	OR	95CI%		p-value
Factor 1: "Healthy"	0.86	0.83	0.88	**$<10^{-4}$**	0.55	0.52	0.57	**$<10^{-4}$**
Factor 2: "Fatty & sweet"	1.14	1.11	1.17	**$<10^{-4}$**	1.25	1.20	1.30	**$<10^{-4}$**
Factor 3: "Animal products and refined cereals "	0.98	0.95	1.01	0.125	0.92	0.88	0.97	**0.002**

OR: odds ratio; CI: confidence interval.

Statistically significant p-values (<0.05 in a chi-squared test) are given in bold type.

eTable 4. Multivariate analyses of food exposure in the subgroup of women, using a multinomial logistic regression								
	Multivariate analyses (vs. never acne) n=6,998 (52%)							
	Past acne n=5,435 (40%)				Current acne n=1,105 (8%)			
	OR	95CI%		p-value	OR	95CI%		p-value
Meat (portions/day)	0.88	0.74	1.05	0.161	0.71	0.51	0.99	**0.042**
Fish (portions/day)	1.05	0.87	1.26	0.642	1.09	0.75	1.59	0.666
Vegetables (portions/day)	1.03	0.98	1.08	0.313	0.92	0.83	1.01	0.078
Fruit (portions/day)	0.98	0.95	1.02	0.389	0.99	0.92	1.06	0.685
Milk (glasses/day)	1.02	0.95	1.10	0.551	1.16	1.02	1.31	**0.028**
Sweet beverages (glasses/day)	0.87	0.74	1.02	0.077	1.12	0.91	1.38	0.284
Dark chocolate (chunks/day)	1.02	0.97	1.07	0.427	1.06	0.97	1.17	0.204
Milk chocolate (chunks/day)	1.02	0.94	1.10	0.697	1.02	0.90	1.16	0.761
Snacks and fast foods (portions/day)	1.13	0.96	1.32	0.136	1.28	1.00	1.65	**0.048**
Fatty and sugary products (portions/day)	1.20	0.92	1.57	0.176	1.51	0.98	2.33	0.060
Refined cereals (portions/day)	1.07	0.99	1.15	0.071	1.08	0.94	1.24	0.280

Details:

One portion of meat, fish, fruit, vegetables, snacks & fast foods, fatty & sugary products, and refined cereals: 100 grams.

One glass of milk or sugary beverage: 200 millilitres.

One chunk of chocolate: 7 grams.

One slice of deli meat: 40 grams.

P-values were obtained in a multinomial logistic regression after adjustment for total calorie intake, the number of dietary records completed, sex, age, smoking status, physical activity, educational level, *BMI, medical history of cancer, diabetes or cardiovascular disease, age at menarche, pregnancy, menopause* and depressive symptoms).

Statistically significant p-values (<0.05) are given in bold type. OR: odds ratio; CI: confidence interval

eTable 5. Observational and interventional studies of the association between diet and acne since 2005									
References	Year	Country	Study design	Population	Total N	Study lentgh	Acne assessment	Exposition	Association found
Adebamowo et al.[5]	2005	USA	Cross-sectional	Female from "Nurses Health II" about their teenage years	45,355	NA	Physician	Dairy products	+
Adebamowo et al.[6]	2006	USA	Cohort	Female (9-15 yo)	6,094	Ø	Self-reported	Dairy products	+
Kaymak et al.[7]	2007	Turkey	Case-control	Male, female (19 - 34 yo)	91 (49 cases)	NA	Clinical exam	Glycemic charge	-
Smith et al.[8]	2007	Australia	Interventional (randomised)	Male (15 - 25 yo)	54 (27 exposed)	12 weeks	Dermatologist	Low glycemic load diet	-
Adebamowo et al.[9]	2008	USA	Cohort	Male (9-15 yo)	4,273	Ø	Self-reported	Dairy products	+
Ghodsi et al.[10]	2009	Iran	Cross-sectional	Male, female (12 - 20 yo)	1,002 (933 cases)	NA	Dermatologist	Sweets Nuts Chocolate Oily food Spicy food	+ + + + 0
Kim et al.[11]	2010	Korea	Interventional	Male, female (18 - 30 yo)	36 (18 exposed)	12 weeks	Dermatologist	Lactoferrin-enriched	-

			(randomised)					fermented milk	
Reynolds et al.[12]	2010	Australia	Interventional	Male (mean age ± SD, 17 ± 1 yo)	43 (23 low GI; 20 high GI)	8 weeks	Dermatologist	Low glycemic index diet vs. High glycemic index diet	0
Aksu et al.[13]	2011	Turkey	Cross-sectional	Male, female (13 - 18 yo)	2,300 (1,353 cases)	NA	Self-reported	Unhealthy fruits and vegetables intake Unhealthy sugar intake Unhealthy fat intake Frequent sausages,burgers intake Fraquent pastries, cakes intake	0 + + + +
Block et al.[14]	2011	USA	Interventional	Male (18 - 35 yo)	10	7 days	Ø	Chocolate	+

Di Landro et al.[15]	2012	Italy	Case-control	Male, female (10 - 24 yo)	563 (205 cases)	NA	Dermatologist	Milk Cheese/Yogurt Bread/Pasta Cakes/Sweets Chocolate Fruits/Vegetables Fish Red meat Ham/Salami	+ 0 0 0 0 0 - 0 0
Ismail et al.[16]	2012	Malaysia	Case-control	Male, female (18 - 30 yo)	88 (44 cases)	NA	Dermatologist	Glycemic load Milk	+ +
Kwon et al.[17]	2012	Korea	Interventional (randomised)	Male, female (20 - 27 yo)	32 (17 exposed)	10 weeks	Dermatologist	Low glycemic load diet	-
Salomone et al.[18]	2012	India	Case-control	Male, female (13 - 25 yo)	80 (40 cases)	NA	Ø	Ice cream ingestion Juices with sugar Carbonated drinks Milk Bread White rice Lower consumption	+ + 0 + + 0 0 -

								of fruits Lower consumption of vegetables	
Wolkenstein et al.[19]	2014	France	Cross-sectional	Male, Female (15 - 24 yo)	2,266 (1,375 cases)	NA	Self-reported	Alcohol Sugary fizzy drink Fast food Dairy product Sweets and chocolate	0 0 0 0 +
Caperton et al.[20]	2014	USA	Interventional (randomised)	Male (18 - 35 yo)	13	7 days	Ø	Chocolate	+
Cao et al[21]	2015	Many	Meta-analysis	2 articles (15 - 27 yo)	75 (44 exposed)	12 weeks	Dermatologist	Low glycemic load diet	-
El Darouti et al.[22]	2015	Egypt	Case-control	Male, female (14 - 36 yo)	400 (200 cases)	NA	Dermatologist	Salty food Spicy food	+ 0
Vongraviopap et al.[23]	2015	Thailand	Interventional	Male, (18 - 25 yo)	25	4 weeks	Dermatologist	Chocolate	+

Okoro et al.[24]	2016	Nigeria	Cross-sectional	Male, female (mean age ± SD, 13 ± 4 yo)	464 (299 cases)	NA	Self-reported	Milk Banana Fried beef Corn Cakes Glycemic index Fried food Fatty food Snacks Fruits	+ + + + + 0 0 0 0 0
Di Landro et al.[25]	2016	Italy	Case-control	Female, (25+ yo)	518 (248 cases)	NA	Dermatologist	Milk Dairy products Starchy foods Cakes and sweets Chocolate Vegetables and fruits Fish Beef	0 0 0 0 - - 0
Larosa et al.[26]	2016	USA	Case-control	Male, female (14 - 19 yo)	225 (120 cases)	NA	Dermatologist	Dairy products	+
Delost et al.[27]	2016	USA	Interventional (randomised)	Male, female (17 - 25 yo)	54 (26 exposed, 28 after swap)	Ø	Dermatologist	Chocolate bar vs. Jelly beans	+

Ulvestad et al.[28]	2016	Norway	Cohort	Male, female (15 - 16, 18 - 19 yo)	2489	Ø	Self-reported	Dairy products	+
Grossi et al.[29]	2016	Italy	Semantic connectivity map approach	Male, female (10 - 24 yo)	563 (205 cases)	NA	Dermatologist	Milk Cheese Swwets/cakes Chocolate	+
Cerman et al.[30]	2016	Turkey	Cross-sectional	Male, female (mean age ± SD, 19 ± 3 yo)	86 (50 cases)	NA	Dermatologist	Dietary glycemic load Milk Glucose	+ 0 0
Burris et al.[31]	2017	USA	Cross-sectional	Male, female (18 - 40 yo)	64 (32 cases)	NA	Dermatologist	Glycemic load / glycemic index	+/0
Aghasi et al.[32]	2018	Many	Meta-analysis	14 articles (9 - 30 yo)	Ø	Ø	Ø	Dairy products	+
Burris et al.[33]	2018	USA	Interventional (randomised)	Male, female (18 - 40 yo)	66 (34 exposed)	2 weeks	Dermatologist	Low glycemic load and glycemic index diet	-
Juhl et al.[34]	2018	Many	Meta-analysis	14 articles (7 - 30 yo)	78,529 (23,046 cases)	Ø	Ø	Dairy products	+
Juhl et al.[35]	2018	Denemark	Case-control	Male, female from GESUS (20 - 96 yo)	20,416 (303 cases)	NA	Self-reported	Dairy products	0

Suppiah et al.[36]	2018	Malaysia	Case-control	Male, Female (14+ yo)	114 (57 cases)	NA	Clinician	Chocolate Sweets Potato chips Nuts Yogurt Ice cream Carbonated drink Milk	+ 0 0 0 0 0 0 +
Stewart et al.[37]	2018	Australia	Case-control	Male, Female (16+ yo)	703 (453 cases)	NA	Clinician	Vegan diet Vitamin D deficiency	0 +
Wolkenstein et al.[38]	2018	Many	Cross-sectional	Male, Female (15 - 24 yo)	10,521 (6,063 cases)	NA	Self-reported	Milk Dairy products Fruit juice Sweetened sodas Chocolate Sweets Ice cream/sorbet Pasta/Rice/Semolina	+ + 0 0 + + 0 +

Huang et al.[39]	2019	China	Cross-sectional	Male, Female (mean age ± SD, 18 ± 1 yo)	8,197 (833 cases)	NA	Dermatologist	Daily water intake except drinks Carbonated soda Sweetened tea drinks Fruit-flavored drinks Alcohol drinking	0 + + + 0

Abbreviations; yo: years old; -: negative association; +: positive association; 0: no association; Ø lack of data; NA: not appropriate
Bibliographic research done between January 2019 – February 2019 for the periode 2005 – February 2019, using the following words combination: acne AND (diet OR nutrition OR dietery) ; acne AND chocolate; acne and (dairy OR milk), in Pubmed.

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