S1 Table. Summary of all literature sources used in this synthesis. A total of 58 studies of the 399 screened had sufficient data on the culture conditions (light intensity, light duration, temperature, nutrients, growth phase, and salinity) and consistent FA variables for analysis beyond initial screening (see S1 File Methods).

Source	Groups covered	Study type[1]	Data type[2]	Salinity	n^3 Groups	n^3~ Taxa	n^3 FA profiles	Treatments, manipulated variables[4]
Ackman & Tocher [1]	Chlorophyta, Chrysophyceae, Diatoms, Dinophyta, Haptophyta, Raphidophyceae, Rhodophyta	Phy	%	Marine	7	11	12	NA
Ahlgren *et al.* [2]	Chlorophyta, Chrysophyceae, Cryptophyta, Cyanobacteria, Dinophyta	Phy	%, %DW	Fresh	5	14	21	growth phase
Bi *et al.* [3]	Cryptophyta, Diatoms, Haptophyta	Phy	%, ug mg C^{-1}	Brackish	3	3	60	nutrient limitation, growth rate
Boersma [4]	Chlorophyta	Tro	%, ug mg C^{-1}	Fresh	1	1	3	nutrient limitation
Broglio *et al.* [5]	Cryptophyta, Diatoms, Dinophyta	Tro	%	Marine	3	3	3	NA
Brown *et al.* [6]	Diatoms	Phy	%, ug mg C^{-1}	Marine	1	1	12	growth phase, light intensity
Chen *et al.* [7]	Cryptophyta, Diatoms, Haptophyta	Tro	%, ug mg C^{-1}	Marine	3	3	6	nutrient limitation
Chen [8]	Diatoms	Phy	%, %DW	Marine	1	12	12	NA (see supp. methods)
Chia *et al.* [9]	Chlorophyta	Phy	%	Fresh	1	1	9	nutrient limitation
Dunstan *et al.* [10]	Chlorophyta	Phy	%, ug mg DW^{-1}	Marine	1	7	9	NA
Dunstan *et al.* [11]	Eustigmatophyceae, Haptophyta	Phy	%, pg FA $cell^{-1}$	Marine	2	3	14	growth phase
Dunstan *et al.* [12]	Diatoms	Phy	%, pg FA $cell^{-1}$	Marine	1	14	14	NA
Dunstan *et al.* [13]	Cryptophyta, Rhodophyta	Phy	%, pg FA $cell^{-1}$	Marine	2	7	11	NA
Dutz *et al.* [14]	Cryptophyta, Diatoms, Dinophyta, Haptophyta	Tro	%^	Marine	4	10	11	NA
Fabregas *et al.* [15]	Eustigmatophyceae	Phy	%	Marine	1	1	5	light intensity
George *et al.* [16]	Chlorophyta, Haptophyta	Tro	%	Marine	2	2	2*	NA
Graeve *et al.* [17]	Diatoms, Dinophyta	Tro	%	Marine	2	2	2*	NA

Guedes *et al.* [18]	Chlorophyta, Cyanobacteria, Diatoms, Eustigmatophyceae, Haptophyta, Rhodophyta	Phy	%	Fresh and Marine	6	23	28	growth phase (only stationary)
Gugger *et al.* [19]	Cyanobacteria	Phy	%	Fresh	1	10	22	NA
Guihéneuf *et al.* [20]	Diatoms, Haptophyta	Phy	%	Marine	2	2	7	NA
Jónasdóttir [21]	Cryptophyta, Diatoms, Dinophyta	Tro	%	Marine	3	3	13*	growth phase
Jónasdóttir & Kiorboe [22]	Cryptophyta, Diatoms, Dinophyta	Tro	%^	Marine	3	7	14*	growth phase
Jónasdóttir *et al.* [23]	Chlorophyta, Diatoms, Dinophyta	Tro	%, pg FA cell^{-1}	Marine	3	5	5	NA
Kawachi *et al.* [24]	Pinguiophyceae	Phy	%	Marine	1	5	5*	NA
Liang *et al.* [25]	Diatoms	Phy	%	Marine	1	2	27	growth phase
Mansour *et al.* [26]	Dinophyta	Phy	%, %DW	Marine	1	5	10	NA
Marshall *et al.* [27]	Raphidophyceae	Phy	%, pg FA cell^{-1}	Marine	1	7	12	NA
Mooney *et al.* [28]	Dinophyta	Phy	%	Marine	1	8	11	NA
Mourente *et al.* [29]	Chlorophyta, Eustigmatophyceae, Haptophyta	Phy	%, %DW	Marine	3	11	12	NA
Müller-Navarra [30]	Chlorophyta, Cryptophyta, Diatoms	Tro	%, ug mg C^{-1}	Fresh	3	3	3	NA
Nichols *et al.* [31]	Dinophyta	Phy	%, %DW	Marine	1	2	2	NA
Nichols *et al.* [32]	Raphidophyceae	Phy	%	Marine	1	2	3	NA
Nichols *et al.* [33]	Haptophyta	Phy	%, pg FA cell^{-1}	Marine	1	1	7	NA
Parrish *et al.* [34]	Chlorophyta, Cryptophyta, Diatoms, Haptophyta	Tro	%	Marine	4	6	6*	NA
Patil *et al.* [35]	Chlorophyta, Cryptophyta, Cyanobacteria, Diatoms, Eustigmatophyceae, Haptophyta, Xanthophyceae	Phy	%, ug mg DW^{-1}	Fresh and Marine	7	12	12	NA
Pernet *et al.* [36]	Diatoms, Haptophyta	Phy	%	Marine	2	2	2	NA
Piepho *et al.* [37]	Chlorophyta, Cryptophyta, Diatoms	Phy	%, ug mg C^{-1}^	Fresh	3	4	56	nutrient limitation, light intensity
Pugh [38]	Diatoms	Phy	%	Brackish and Marine	1	1	8	growth phase, salinity

[39]	Chlorophyta, Diatoms, Dinophyta, Haptophyta	Phy	%, ug mg DW^{-1}	Marine	4	7	14	nutrient limitation (degrees of limitation)
Renaud *et al.* [40]	Diatoms, Haptophyta	Phy	%	Brackish	2	2	8	light intensity
Renaud *et al.* [41]	Chlorophyta, Cryptophyta, Diatoms, Haptophyta, Rhodophyta	Phy	%, %DW	Brackish	5	15	18	NA
Renaud *et al.* [42]	Cryptophyta, Diatoms, Haptophyta	Phy	%, %DW	Brackish	3	5	20	temperature
Rezanka *et al.* [43]	Cyanobacteria	Phy	%	Fresh	1	6	6	nutrient limitation (only limited)
Schwenk *et al.* [44]	Chlorophyta, Cyanobacteria, Diatoms, Dinophyta, Haptophyta	Phy	%, %DW	Brackish and Marine	5	17	35	nutrient limitation, growth phase, temperature, salinity
Skerratt *et al.* [45]	Diatoms, Haptophyta	Phy	%, pg FA $cell^{-1}$	Marine	2	3	9	UV radiation
Taipale *et al.* [46]	Chlorophyta, Chrysophyceae, Cryptophyta, Diatoms, Euglenozoa, Raphidophyceae	Phy	%	Fresh	6	35	37	NA
Tang *et al.* [47]	Cryptophyta, Haptophyta	Tro	%	Marine	2	2	2	NA
Thompson *et al.* [48]	Chlorophyta, Diatoms, Haptophyta	Phy	%	Marine	3	8	38	temperature
Thompson *et al.* [49]	Diatoms, Haptophyta	Tro	%	Marine	2	2	4	light intensity
Thor *et al.* [50]	Chlorophyta, Dinophyta, Haptophyta	Tro	%^	Marine	3	3	3	NA
Tremblay *et al.* [51]	Cryptophyta, Diatoms	Tro	%, pg FA $cell^{-1}$	Marine	2	3	3	NA
Vargas *et al.* [52]	Cyanobacteria	Phy	%, %DW	Fresh	1	7	12	NA
Veloza *et al.* [53]	Chlorophyta, Cryptophyta	Tro	%, ug mg C^{-1}	Marine	2	2	2*	NA
Viso & Marty [54]	Chlorophyta, Cryptophyta, Cyanobacteria, Diatoms, Dinophyta, Haptophyta, Raphidophyceae, Rhodophyta, Xanthophyceae	Phy	%, ug mg C^{-1}	Marine	9	28	28	NA

Volkman *et al.* [55]	Chlorophyta, Cryptophyta, Diatoms, Haptophyta	Phy	%, pg FA $cell^{-1}$	Marine	4	10	10	NA
Wacker *et al.* [56]	Chlorophyta, Cyanobacteria, Eustigmatophyceae, Haptophyta	Tro	%, ug mg POC^{-1}	Fresh and Marine	4	5	5	NA
Wenzel *et al.* [57]	Cryptophyta	Tro	%, ug mg C^{-1}	Fresh	1	1	1	NA
Zhukova & Aizdaicher [58]	Chlorophyta, Cryptophyta, Diatoms, Dinophyta, Haptophyta, Rhodophyta	Phy	%	Marine	6	15	15	NA

[1] Study type abbreviations are 'Phy' for phycological studies, and 'Tro' for trophic studies
[2] Data types: '%' is percent of total FA (from papers that extracted FA from total lipids); '%DW' is FA percent of algal dry weight.
[3] If a different number of profiles were present in each data set the group number, n Taxa, and n FA profiles is based on % total FA data
[4] The treatments and manipulated variables column summarizes additional experimental manipulations in some studies
~this is the number of unique species, with different names, in the study that made it through the screening protocol and into the master file (see S1 File Methods)

^authors provided additional raw data beyond what is shown in the original manuscript

*Studies with one environmental variable missing; these profiles could not be used in DISTLM analysis, but were included in calculating food quality index

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