



<https://doi.org/10.1038/s41684-024-01456-6>

---

# **The effect of laboratory diet and feeding on growth parameters in juvenile zebrafish**

---

In the format provided by the authors and unedited

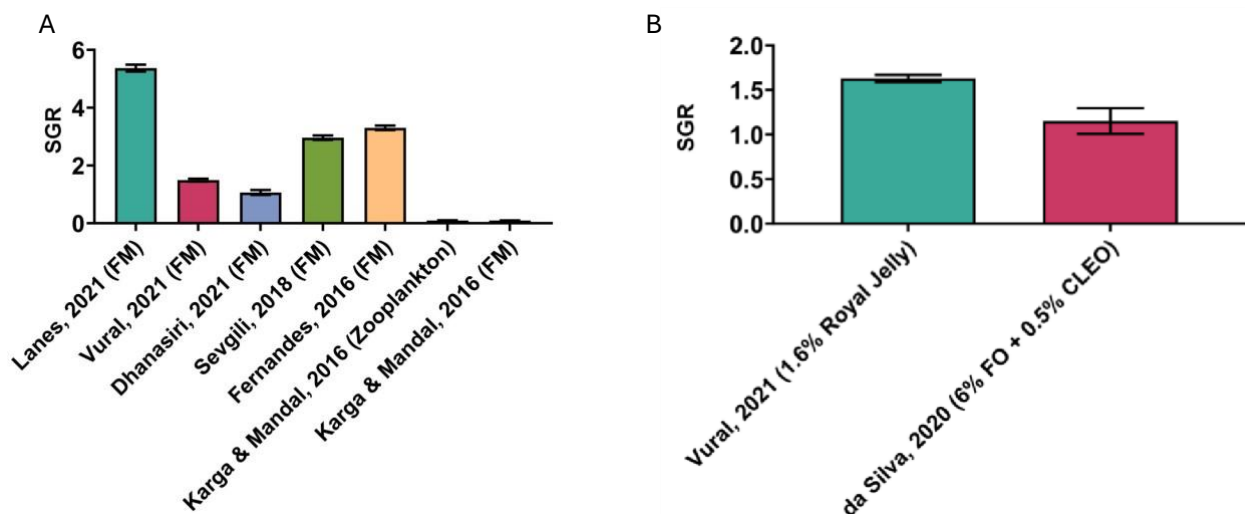
671 **Supplementary Information**

672 **Supplementary Figures**

673 **Supplementary Fig. 1**

674 The sub-group analysis findings for category 3 and 5 SGR are seen in Supplementary  
675 Fig. 1. Animal-based diets produced a significant effect on SGR between the studies  
676 (One-way ANOVA:  $F_{(6, 360)} = 492.6, p < 0.0001$ ) (Supplementary Fig.1A). Lanes (2021)  
677 was found to produce the greatest increase in SGR compared to all other feeds with  
678 Tukey's multiple comparison test. No difference was seen between Sevgili (2018)  
679 and Fernandes (2016) with 50% FM. Similarly, no significant difference was seen  
680 between Vural (2021) and Dhanasiri (2020) with FM. Comparatively, the student's t-  
681 test determined no significant difference between 1.6% Royal Jelly compared to 6%  
682 FO and 0.5% CLEO in category 5 for SGR (student's t-test:  $t(63) = 0.9485, p = 0.3465$ )  
683 (Supplementary Fig. 1B)<sup>26,36</sup>.

684 **Supplementary Fig. 1 | The SGR sub-group analysis for categories 3 and 5.**



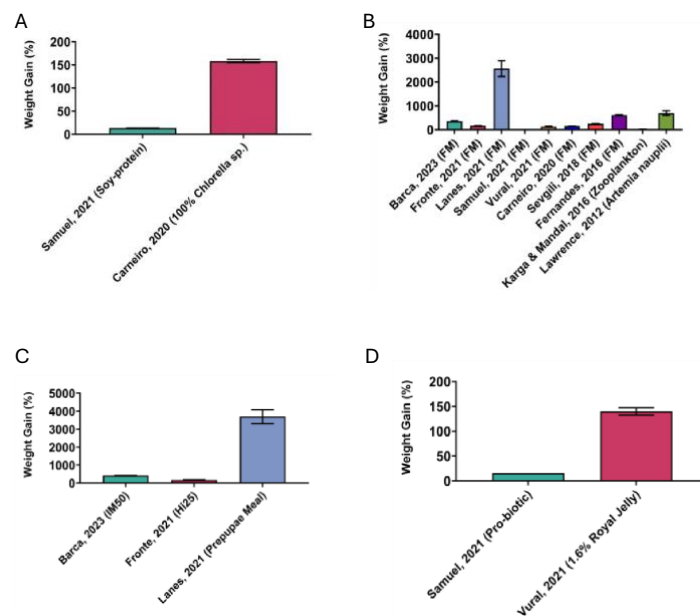
685  
686 Note: The sub-group analyses for category 3 (A) and category 5 (B) SGR findings using a  
687 one-way ANOVA (A) and student's t-test (B). The significance values are not included  
688 on the graphs due to too many significance values. Please see the GraphPad file on  
689 OSF for full analysis results.

690 **Supplementary Fig. 2**

691 The sub-group analysis findings for categories 2-5 percentage weight gain are seen  
692 in Supplementary Fig. 2. A plant-based diet resulted in a significant effect on  
693 percentage weight gain with 100% *Chlorella sp.* causing a significant increase in

694 weight gain compared to soy-protein (student's t-test:  $t(83) = 15.44, p < 0.0001$ )  
 695 (Supplementary Fig. 2A). An animal-based diet also caused a significant effect on  
 696 overall percentage weight gain (one-way ANOVA:  $F_{(9, 630)} = 24.28, p < 0.0001$ )  
 697 (Supplementary Fig. 2B). Tukey's multiple comparison test confirmed Lanes (2021)  
 698 to produce the greatest increase in weight compared to all other studies. Lanes  
 699 (2021) was also found to produce the greatest weight gain in category 4 (one-way  
 700 ANOVA:  $F_{(2, 237)} = 53.94, p < 0.0001$ ) (Supplementary Fig. 2C). No difference was seen  
 701 between the two other insect-based diets. A significant effect on weight gain was  
 702 seen in category 5 with 1.6% Royal Jelly significantly increasing percentage weight  
 703 gain compared to a pro-biotic supplement (student's t-test:  $t(13) = 24.09, p < 0.0001$ )  
 704 (Supplementary Fig. 2D).

705 **Supplementary Fig. 2 | The sub-group analysis for categories 2-5 for weight gain (%).**



706

707 Note: The sub-group analyses for category 2 (A), 3 (B), 4 (C) and 5 (D) for weight  
 708 gain (%) using a one-way ANOVA (B and C) and student's t-test (A and D). The  
 709 significance values are not included on the graphs due to too many significance  
 710 values. Please see the GraphPad file on OSF for full analysis results.

711

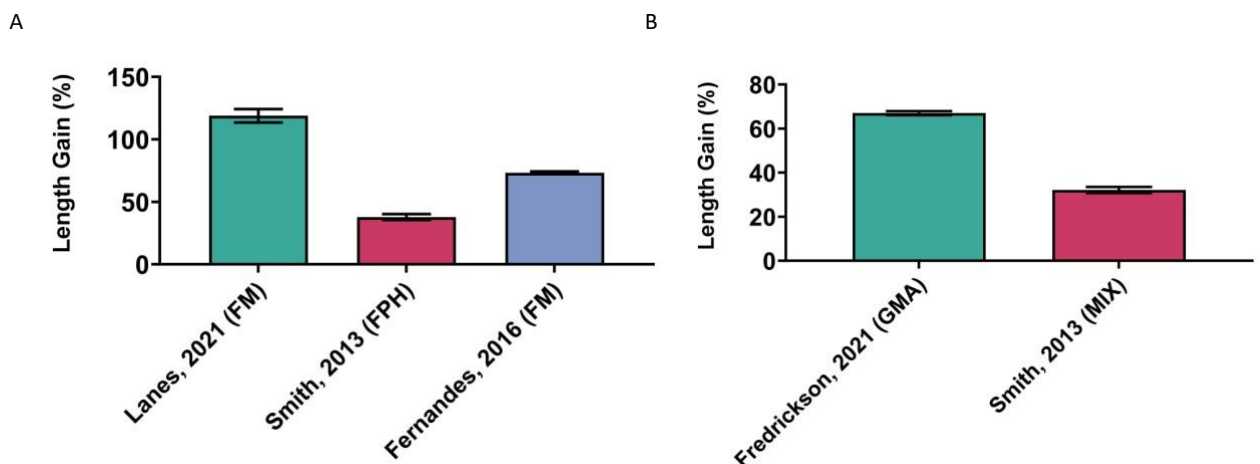
712

713 **Supplementary Fig. 3**

714 The sub-group analysis for category 3 and 6 for percentage length gain are seen in  
715 Supplementary Fig. 3. Lanes (2021) FM-based diet produced the greatest increase in  
716 percentage length gain (one-way ANOVA:  $F_{(2, 167)} = 62.73, p < 0.0001$ ) (Supplementary Fig.  
717 3A). The other FM-based diet also had significantly increased percentage length gain  
718 compared to the fish protein hydrolysate diet <sup>28,30</sup>. A mix of protein sources also significantly  
719 impacted length gain results (student's t-test:  $t(620) = 10.83, p < 0.0001$ ) (Supplementary  
720 Fig. 3B).

721 **Supplementary Fig. 3 | The sub-group analysis for categories 3 and 6 for length gain (%).**

722



723

724

725 Note: The sub-group analyses for category 3 (A) and 6 (B) for length gain (%) using a one-  
726 way ANOVA (A) and student's t-test (B). The significance values are not included on the  
727 graphs due to too many significance values. Please see the GraphPad file on OSF for full  
728 analysis results.

729

730 **Supplementary Fig. 4**

731 The flow chart depicting the analytical steps for the statistical comparisons included in  
732 this analysis.

733

734

735

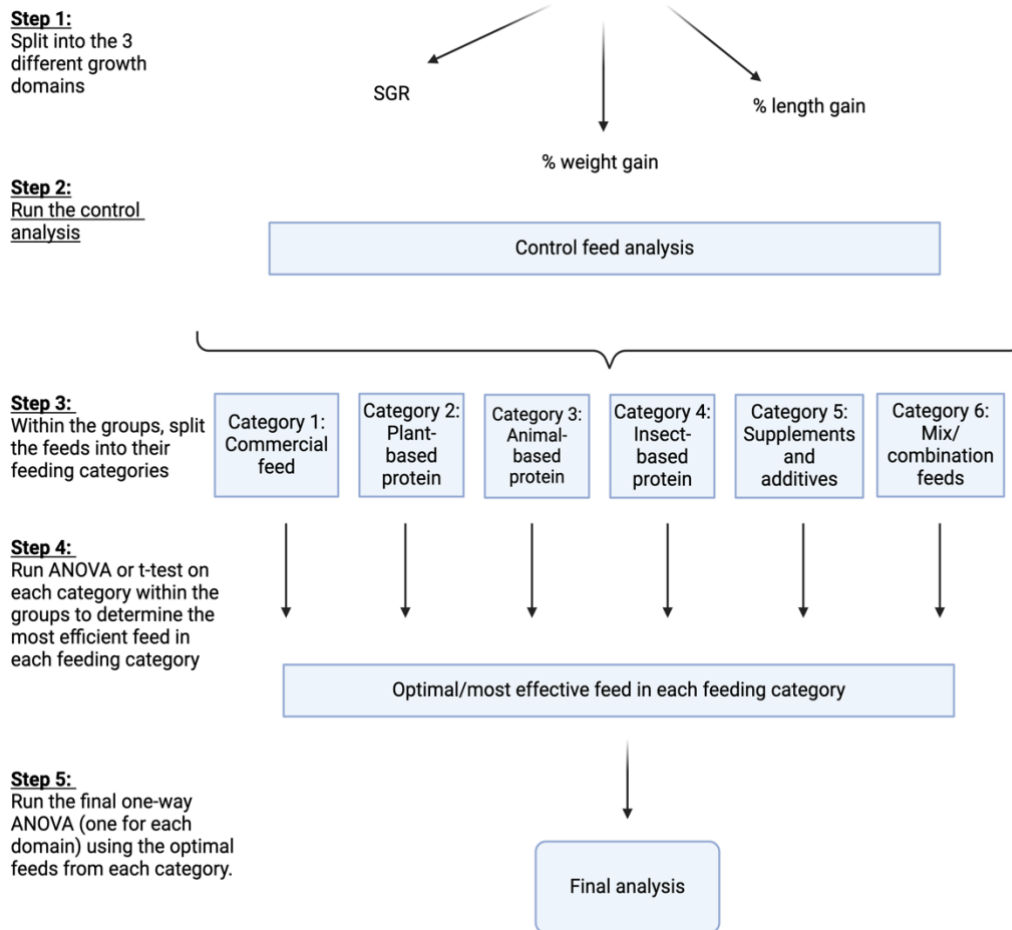
736

737

738

739 **Supplementary Fig. 4 | Flow chart of analytical steps use for statistical comparisons.**

740



741

742 Note: An overview of the steps taken to perform the analysis presented in this paper.

743

Figure was generated using Biorender.com.

744

745 **Supplementary Tables**746 **Supplementary Table 1**

747 The statistical data that was used in the analysis included in this review is seen in Supplementary Table 1.

748 **Supplementary Table 1 | The experimental data used in the current analysis from the studies describing the growth and survival effects of**  
749 **different feeds on juvenile zebrafish.**

Author, year	SGR (% ± SE)	Weight gain (% ± SE)	Standard length gain (% ± SE)	Survival rate (% ± SE)
<b>Barca, 2023</b>		D1: 360.78 ± 7.68 D2: 392.25 ± 6.86 D3: 392.52 ± 7.09 D4: 417.91 ± 7.14		D1: 95 D2: 98.5 D3: 100 D4: 93.6
<b>Fronte, 2021</b>		D1: 169.64 ± 9.98 D2: 178.94 ± 10.44 D3: 181.63 ± 10.08 D4: 166.16 ± 9.74		D1: 88.75 D2: 92.5 D3: 88.75 D4: 93.75
<b>Lanes, 2021</b>	D1: 5.37 ± 0.12 D2: 5.67 ± 0.14 D3: 5.97 ± 0.04	D1: 2559.8 ± 20.81 D2: 3088.2 ± 26.45 D3: 3694 ± 10.07	D1: 118.91 ± 0.6986 D2: 137.39 ± 0.7431 D3: 150.87 ± 0.3970	D1: 92.50 ± 3.23 D2: 93.75 ± 4.73 D3: 96.25 ± 2.39
<b>Samuel, 2021</b>		D1: 14.38 ± 0.2 D2: 14.0 ± 0.01 D3: 15.7 ± 0.08 D4: 14.99 ± 0.11 D5: 13.27 ± 0.15		
<b>Vural, 2021</b>	D1: 1.49 ± 0.05 D2: 1.54 ± 0.09 D3: 1.07 ± 0.09 D4: 1.63 ± 0.04 D5: 1.54 ± 0.03	D1: 230.14 ± 6.90 D2: 237.04 ± 11.85 D3: 182.04 ± 8.80 D4: 249.11 ± 5.45 D5: 237.01 ± 4.12		D1: 79.33 ± 6.77 D2: 82.67 ± 5.81 D3: 88.0 ± 1.15 D4: 78.67 ± 10.48 D5: 84.00 ± 1.15
<b>Carneiro, 2020</b>	D1: 1.55 ± 0.0 D2: 1.61 ± 0.0 D3: 1.56 ± 0.0 D4: 1.55 ± 0.0 D5: 1.66 ± 0.0 D6: 1.58 ± 0.0	D1: 153.12 ± 2.3 D2: 163.87 ± 7.7 D3: 155.56 ± 2.5 D4: 154.27 ± 4.6 D5: 170.02 ± 2.9 D6: 158.39 ± 4.2		D1: 88.6 ± 3.6 D2: 94.3 ± 4.2 D3: 88.6 ± 2.9 D4: 88.6 ± 2.9 D5: 87.1 ± 3.5 D6: 91.5 ± 2.7

<b>da Silva, 2020</b>	D1: 0.46 ± 0.07 D2: 0.74 ± 0.15 D3: 0.78 ± 0.14 D4: 1.15 ± 0.15 D5: 0.85 ± 0.09 D6: 1.04 ± 0.13 D7: 0.93 ± 0.12		D1: 31.07 ± 1.65 D2: 33.23 ± 1.29 D3: 34.16 ± 1.59 D4: 34.79 ± 1.12 D5: 34.23 ± 1.29 D6: 36.38 ± 1.35 D7: 36.89 ± 1.02	D1: 100 D2: 100 D3: 100 D4: 100 D5: 100 D6: 100 D7: 100
<b>Dhanasari, 2020</b>	D1: 1.0679 ± 0.085 D2: 0.9119 ± 0.045 D3: 1.0157 ± 0.097 D4: 1.0756 ± 0.139			
<b>Sevgili, 2018</b>	D1: 2.90 ± 0.075 D2: 2.91 ± 0.075 D3: 3.05 ± 0.075 D4: 3.00 ± 0.075 D5: 3.02 ± 0.075 D6: 2.83 ± 0.075 D7: 2.96 ± 0.075 D8: 2.88 ± 0.075	D1: 238.22 ± 9.43 D2: 239.66 ± 9.47 D3: 260.00 ± 10.0 D4: 252.40 ± 10.10 D5: 254.81 ± 10.20 D6: 228.46 ± 10.17 D7: 247.05 ± 10.49 D8: 234.78 ± 10.35		
<b>Fernandes, 2016</b>	D1: 2.4 ± 0.08 D2: 2.6 ± 0.08 D3: 2.8 ± 0.08 D4: 2.9 ± 0.08 D5: 3.2 ± 0.08 D6: 3.2 ± 0.08 D7: 3.4 ± 0.08 D8: 3.3 ± 0.08 D9: 3.4 ± 0.08 D10: 3.3 ± 0.08	D1: 37.43 ± 2.85 D2: 40.00 ± 2.83 D3: 42.54 ± 2.93 D4: 43.55 ± 2.97 D5: 46.54 ± 2.88 D6: 47.34 ± 2.99 D7: 47.78 ± 3.00 D8: 46.79 ± 3.00 D9: 48.00 ± 3.03 D10: 47.29 ± 3.03	D1: 44.57 ± 0.705 D2: 54.35 ± 0.800 D3: 56.52 ± 0.826 D4: 58.70 ± 0.846 D5: 66.85 ± 0.920 D6: 66.30 ± 0.906 D7: 69.57 ± 0.937 D8: 73.37 ± 0.963 D9: 72.83 ± 0.958 D10: 69.02 ± 0.933	D1: 98 ± 1.04 D2: 93 ± 1.04 D3: 98 ± 1.04 D4: 100 ± 1.04 D5: 100 ± 1.04 D6: 100 ± 1.04 D7: 98 ± 1.04 D8: 93 ± 1.04 D9: 95 ± 1.04 D10: 95 ± 1.04
<b>Karga &amp; Mandal, 2016</b>	D1: 0.097 ± 0.004 D2: 0.051 ± 0.005 D3: 0.089 ± 0.003 D4: 0.092 ± 0.004	D1: 22.62 ± 11.23 D2: 11.29 ± 4.82 D3: 20.41 ± 2.43 D4: 21.51 ± 4.17		D1: 86.67 ± 1.67 D2: 78.33 ± 3.33 D3: 83.33 ± 4.41 D4: 81.67 ± 1.67
<b>Smith, 2013</b>			D1: 5.85 ± 1.1097 D2: 5.44 ± 0.82 D3: 5.33 ± 1.1671 D4: 4.19 ± 0.5782 D5: 4.53 ± 0.8266	

<b>Lawrence, 2012</b>		D1: 723.09 ± 128.75 D2: 837.97 ± 32.67 D3: 900.69 ± 47.40 D4: 937.73 ± 79.38 D5: 221.46 ± 42.75	D1: 97.92 ± 27.18 D2: 110.17 ± 18.42 D3: 112.05 ± 9.89 D4: 109.11 ± 8.67 D5: 57.29 ± 13.77	D1: 96.9 ± 1.9 D2: 99.4 ± 0.6 D3: 98.8 ± 0.8 D4: 98.8 ± 1.6 D5: 98.8 ± 2.1
-----------------------	--	---	--	--



751 **Supplementary Table 2**

752 The suggested experimental parameters for future juvenile zebrafish nutritional studies  
753 determined from the analysis presented in this present review can be seen in Supplementary  
754 Table 2.

755 **Supplementary Table 2 | The suggested experimental parameters for juvenile zebrafish**  
756 **nutritional studies.**

<b>Parameter</b>	<b>Our Recommendation</b>
Age at the start of the study	30 dpf
Age at the end of the study	89 dpf
Feeding frequency	2x/day
Frequency of recording	1/week
Growth parameters to be recorded	SGR, width, weight, length, survival
pH	7.4
Population density	5/L
Reporting	Full reporting of all recordings and husbandry conditions to be provided in text or using an open-source framework
Sex split	1:1
Temperature	28.5°C

757 Note: Key; dpf: days post-fertilisation, L: litre, SGR: specific growth rate.

758

759 **Supplementary Table 3**

760 The nutritional composition of the different experimental feeds as reported in the included papers is seen in Supplementary Table 3.

761 **Supplementary Table 3 | The nutritional composition (% inclusion) of the different feeds included in the present review.**

Author, year	Dry matter (%)	Crude ash (%)	Crude lipid (%)	Crude protein (%)	Gross Energy (MJ/Kg)
Barca, 2023*		D1: 8.07 D2: 7.09 D3: 6.15 D4: 5.13	D1: 13.61 D2: 14.77 D3: 15.73 D4: 16.75	D1: 58.84 D2: 58.36 D3: 58.53 D4: 58.42	D1: 20.91 D2: 20.91 D3: 20.77 D4: 20.62
Frederickson, 2021					
Fronte, 2021		D1: 5 D2: 4.7 D3: 4.4 D4: 3.8	D1: 15.2 D2: 15.5 D3: 15.9 D4: 15.5	D1: 60.4 D2: 60.0 D3: 60.2 D4: 59.8	D1: 21.9 D2: 21.9 D3: 21.8 D4: 21.6
Lanes, 2021	D1: 94.53 D2: 92.69 D3: 93.30	D1: 22.19 D2: 9.16 D3: 9.01	D1: 9.40 D2: 9.70 D3: 9.13	D1: 46.43 D2: 45.39 D3: 46.92	D1: 17.09 D2: 18.74 D3: 18.57
Samuel, 2021	D1: 90.0 D2: 92.0 D3: N/A D4: N/A D5: N/A	D1: 5.23 D2: 4.6 D3: N/A D4: N/A D5: N/A	D1: 4.1 D2: 3.9 D3: N/A D4: N/A D5: N/A	D1: 45.7 D2: 48.1 D3: 30 D4: N/A D5:30	D1: 12.02 D2: 11.02 D3: N/A D4: N/A D5: N/A
Vural, 2021		D1: 3.84 D2: 3.84 D3: 3.84 D4: 3.84 D5: 3.84	D1: 14.25 D2: 14.25 D3: 14.27 D4: 14.34 D5: 14.63	D1: 45.68 D2: 45.69 D3: 45.74 D4: 45.92 D5: 46.65	
Carneiro, 2020	D1: 88.7 D2: 88.7 D3: 87.8 D4: 89.9 D5: 88.4 D6: 88.3	D1: 8.7 D2: 9.3 D3: 7.44 D4: 8.23 D5: 9.4 D6:10.0		D1: 32.3 D2: 32.7 D3: 31.9 D4: 32.5 D5: 32.3 D6: 31.6	D1: 16.7 D2: 16.7 D3: 16.7 D4: 16.7 D5: 16.7 D6: 16.7
Da Silva, 2020				D1: 51.82 D2: 51.26 D3: 51.15 D4: 50.97	D1: 17.16 D2: 17.28 D3: 17.57 D4: 17.23

				D5: 51.06 D6: 50.85 D7: 51.47	D5: 17.41 D6: 17.68 D7: 17.13
<b>Dhanasiri, 2020</b>			D1: 12.0 D2: 10.7 D3: 9.4 D4: 9.8	D1: 56.2 D2: 49.9 D3: 55.0 D4: 59.1	
<b>Sevgili, 2018</b>	20P: 91.41 25P: 91.74 30P: 91.64 35P: 91.89 40P: 92.31 45P: 92.24 50P: 92.66 55P: 92.49	20P: 5.75 25P: 6.73 30P: 6.94 35P: 7.63 40P: 8.21 45P: 8.98 50P: 9.71 55P: 10.51	20P: 10.26 25P: 10.02 30P: 10.32 35P: 10.94 40P: 10.62 45P: 9.97 50P: 10.28 55P: 10.34	20P: 20.38 25P: 26.22 30P: 28.93 35P: 34.94 40P: 39.56 45P: 44.2 50P: 49.72 55P: 56.88	20P: 19.82 25P: 19.69 30P: 19.7 35P: 19.81 40P: 19.74 45P: 19.47 50P: 19.58 55P: 19.62
<b>Fernandes, 2016</b>	15P: 89.2 20P: 90.1 25P: 91.3 30P: 92.4 35P: 90.6 40P: 93.1 45P: 94.3 50P: 93.8 55P: 94.2 60P: 93.6	15P: 10.9 20P: 11.2 25P: 12.1 30P: 12.9 35P: 13.2 40P: 14.2 45P: 14.6 50P: 15.4 55P: 15.8 60P: 16.5	15P: 8.7 20P: 8.9 25P: 8.4 30P: 8.0 35P: 8.8 40P: 8.7 45P: 8.8 50P: 9.4 55P: 10.0 60P: 10.1	15P: 15.5 20P: 19.0 25P: 24.8 30P: 30.0 35P: 35.0 40P: 40.9 45P: 45.7 50P: 50.0 55P: 56.3 60P: 61.6	15P: 18.4 20P: 18.3 25P: 18.0 30P: 18.3 35P: 18.6 40P: 18.2 45P: 18.7 50P: 19.1 55P: 18.9 60P: 18.9
<b>Karga &amp; Mandal, 2016</b>	D1: 9.62 D2: 90.52 D3: 90.36 D4: 90.1	D1: 6.15 D2: 3.41 D3: 3.29 D4: 3.11	D1: 12.95 D2: 3.86 D3: 4.58 D4: 5.41	D1: 54.18 D2: 35.12 D3: 39.76 D4: 44.40	D1: 17.34 D2: 14.02 D3: 15.66 D4: 15.71
<b>Smith, 2013</b>		D1: 6.84 D2: 8.37 D3: 7.89 D4: 6.86 D5: 5.95	D1: 12.34 D2: 15.86 D3: 10.47 D4: 10.33 D5: 11.10	D1: 44.9 D2: 45.3 D3: 44.5 D4: 43.9 D5: 49.5	

Lawrence, 2012					
----------------	--	--	--	--	--

762

763

**Supplementary Tables 4 and 5**

764

The PRISMA checklist for requirements of systematic reviews and meta-analysis is found in Supplementary Table 4 including the location in the present review and the abstract checklist is in Supplementary Table 5.

765

766

**Supplementary Table 4 | The PRISMA checklist for systematic reviews and meta-analyses for this present review.**

Section and Topic	Item #	Checklist item	Location where item is reported
<b>TITLE</b>			
Title	1	Identify the report as a systematic review.	1.0
<b>ABSTRACT</b>			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Supplementary data
<b>INTRODUCTION</b>			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	1.0
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	1.0
<b>METHODS</b>			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	2.2

Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	2.1
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	2.1
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	2.2
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	2.3
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	2.3
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	2.3
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	2.4
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	2.5
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	2.5
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	2.5
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	2.5

	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	2.5
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, metaregression).	2.5
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	2.5
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	2.5
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	2.5
<b>RESULTS</b>			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	3.1
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	3.1
Study characteristics	17	Cite each included study and present its characteristics.	3.2
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	3.3
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Supplementary data

Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	3.4/5
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	3.4/5
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	5
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	N/A
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	3.3
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	3.5/6
<b>DISCUSSION</b>			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	4
	23b	Discuss any limitations of the evidence included in the review.	4
	23c	Discuss any limitations of the review processes used.	4
	23d	Discuss implications of the results for practice, policy, and future research.	4

<b>OTHER INFORMATION</b>			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Review was not registered
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	OSF
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	N/A
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	declarations
Competing interests	26	Declare any competing interests of review authors.	The authors declare no competing interests
Availability of data, code	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	OSF
and other materials			

767

768

769

770

771



**Supplementary Table 5 | The PRISMA abstract checklist for systematic reviews and meta-analyses for the present review.**

Section and Topic	Item #	Checklist item	Reported (Yes/No)
<b>TITLE</b>			
Title	1	Identify the report as a systematic review.	Yes
<b>BACKGROUND</b>			
Objectives	2	Provide an explicit statement of the main objective(s) or question(s) the review addresses.	Yes
<b>METHODS</b>			
Eligibility criteria	3	Specify the inclusion and exclusion criteria for the review.	Yes
Information sources	4	Specify the information sources (e.g. databases, registers) used to identify studies and the date when each was last searched.	Yes
Risk of bias	5	Specify the methods used to assess risk of bias in the included studies.	Yes
Synthesis of results	6	Specify the methods used to present and synthesise results.	Yes
<b>RESULTS</b>			
Included studies	7	Give the total number of included studies and participants and summarise relevant characteristics of studies.	Yes
Synthesis of results	8	Present results for main outcomes, preferably indicating the number of included studies and participants for each. If meta-analysis was done, report the summary estimate and confidence/credible interval. If comparing groups, indicate the direction of the effect (i.e. which group is favoured).	Yes

<b>DISCUSSION</b>			
Limitations of evidence	9	Provide a brief summary of the limitations of the evidence included in the review (e.g. study risk of bias, inconsistency and imprecision).	Yes
Interpretation	10	Provide a general interpretation of the results and important implications.	Yes
<b>OTHER</b>			
Funding	11	Specify the primary source of funding for the review.	(declarations)
Registration	12	Provide the register name and registration number.	N/A

774 **Supplementary Table 6**

775 The table including the searches conducted number of hits and number of articles found that  
 776 are included in the analysis is reported on in Supplementary Table 6.

777 **Supplementary Table 6 |The searches conducted, number of hits and the number of**  
 778 **articles found which were included in the present analysis.**

Date of Search	Search String	Database	Number of hits	Number of articles included in analysis
18/08/2023	Zebrafish AND diet AND growth	PubMed	285	6
21/08/2023	Zebrafish AND diet AND welfare	PubMed	15	0
21/08/2023	Zebrafish AND diet AND health	PubMed	212	0
21/08/2023	Zebrafish AND feed AND welfare	PubMed	14	0
21/08/2023	Zebrafish OR 'danio rerio' AND feed OR diet OR feeding AND welfare	Scopus	14	0
21/08/2023	zebrafish AND feed OR diet AND reproduction OR survival OR growth	Scopus	525	7
22/08/2023	N/A	citations and references	N/A	2

779