

Table 20 Tukey's HSD analysis of morphometric parameters of fish fed with control and Levamisole mixed diets under normal and *Aeromonas* infection

S. No.	Pairwise comparison	Tukey's HSD	Q – value	p – value
1	T1 : T2	0.29	0.17	0.99934 ^{NS}
2	T1 : T3	0.91	0.55	0.97986 ^{NS}
3	T1 : T4	0.46	0.28	0.99731 ^{NS}
4	T2 : T3	1.19	0.72	0.95613 ^{NS}
5	T2 : T4	0.74	0.45	0.98873 ^{NS}
6	T3 : T4	0.45	0.27	0.99743 ^{NS}

T1 – Healthy fish fed with control diet

T2 - *Aeromonas* infected fish fed with control diet

T3 – Healthy fish fed with Levamisole mixed diet

T4 – *Aeromonas* infected fish fed with Levamisole mixed diet

Q-value - studentized range statistic value

$p < 0.05$ - Significant

p -value* = Significant, p -value** = highly significant, p -value*** = extremely significant,

p -value^{NS} = Not Significant

Though there is no significant change between the groups, finally the vitamin C and vitamin E have shown the improvement in growth performance and morphometric characteristics of the experimental fish.

3.3 Haemoglobin

The Table 21, shows the mean haemoglobin values of healthy and *Aeromonas*-infected *Catla catla* fish that were treated with different immunostimulant mixed feeds such as vitamin C, vitamin E, chitin, chitosan, and levamisole as well as the control feed. Based on these data, it was shown that the average haemoglobin values in all test groups varied significantly. The average haemoglobin values in healthy fish treated with different immunostimulant-supplemented feeds ranged from 6.86 ± 0.37 to 14.61 ± 0.35 gm/dL. In *Aeromonas* infected fish, haemoglobin levels with different immunostimulant mixed feeds typically vary from 5.99 ± 0.66 to 13.04 ± 0.19 gm/dL.

Table 21 Haemoglobin content in the fish fed with different immunostimulant mixed feeds under normal and *Aeromonas hydrophila* infected conditions

S. No.	Experimental feed	Mean Haemoglobin (g/dL)		F – value	p – value
		Healthy fish	<i>Aeromonas</i> infected fish		
1	Control feed	6.86 ± 0.37	5.99 ± 0.66	3.92	0.118 ^{NS}
2	Vitamin C mixed feed	13.61 ± 0.35	12.81 ± 0.17	11.03	0.023*
3	Vitamin E mixed feed	14.61 ± 0.35	13.04 ± 0.19	48.28	0.022*
4	Chitin mixed feed	9.61 ± 0.21	7.84 ± 0.59	13.21	0.022*
5	Chitosan mixed feed	9.79 ± 0.49	8.83 ± 0.33	7.79	0.045*
6	Levamisole mixed feed	12.65 ± 0.22	11.77 ± 0.26	20.01	0.011*

p -value* = Significant, p -value** = highly significant, p -value*** = extremely significant, p -value^{NS} = Not Significant

The mean haemoglobin levels in healthy fish fed with immunostimulant mixed feed such as control, vitamin C, vitamin E, chitin, chitosan, and levamisole were found to be 6.86 ± 0.37 , 13.61 ± 0.4 , 14.61 ± 0.35 , 9.16 ± 0.21 , 9.79 ± 0.49 , and 12.65 ± 0.22 gm/dL respectively. As well as, the mean haemoglobin levels in *Aeromonas* infected fish fed with immunostimulant mixed feed such as control, vitamin C, vitamin E, chitin, chitosan, and levamisole were found to be 5.99 ± 0.66 , 12.81 ± 0.17 , 13.04 ± 0.19 , 7.84 ± 0.59 , 8.83 ± 0.33 , and 11.77 ± 0.26 g/dL respectively.

The quantity of haemoglobin significantly varies between healthy and *Aeromonas* infected fish from all the treatment groups. The p -values for the haemoglobin content of the healthy and *Aeromonas* infected fish in the treatment groups of control, vitamin C, vitamin E, chitin, chitosan, and levamisole were measured as 0.118, 0.023, 0.002, 0.022, 0.045, and 0.011 respectively. These results demonstrated that the tested immunostimulants significantly increased haemoglobin content in both healthy and *Aeromonas* infected fish when compared to the control.