

3.6.5 Monocytes

The average monocyte counts of healthy and *Aeromonas* infected *Catla catla* fish treated with various immunostimulant mixed diets are shown in Table 28. According to these data, it was demonstrated that the average monocyte count differed considerably across all test groups. The mean monocyte counts in healthy fish treated with various immunostimulant mixed feeds ranged from 178 ± 0.64 to 370 ± 0.51 cells/mm³. Whereas, in *Aeromonas*-infected fish, the monocyte counts varied between 462 ± 0.56 and 685 ± 0.77 cells/mm³ with the use of different immunostimulant mixed feeds.

Table 28 Monocyte counts in the fish fed with different immunostimulant mixed feeds under normal and *Aeromonas hydrophila* infected conditions

S. No.	Experimental feed	Monocytes (cells/mm ³)		F- value	p-value
		Healthy fish	<i>Aeromonas</i> infected fish		
1	Control feed	178 ± 0.64	462 ± 0.56	32.53	0.0046**
2	Vitamin C mixed feed	287 ± 0.62	654 ± 0.61	52.88	0.0019**
3	Vitamin E mixed feed	370 ± 0.51	685 ± 0.77	34.5	0.0041**
4	Chitin mixed feed	247 ± 0.4007	547 ± 0.625	48.75	0.0022**
5	Chitosan mixed feed	261 ± 0.45	556 ± 0.62	41.14	0.0030**
6	Levamisole mixed feed	274 ± 0.66	492 ± 0.72	14.85	0.018*

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

The mean monocyte counts in healthy fish fed with immunostimulant mixed feed such as control, vitamin C, vitamin E, chitin, chitosan, and levamisole were found to be 178 ± 0.64 , 287 ± 0.62 , 370 ± 0.51 , 247 ± 0.4007 , 261 ± 0.45 , and 274 ± 0.66 cells/mm³ respectively. As well as, the mean monocyte counts in *Aeromonas* infected fish fed with immunostimulant mixed feed such as control, vitamin C, vitamin E, chitin, chitosan, and levamisole were found to be 462 ± 0.56 , 654 ± 0.61 , 685 ± 0.77 , 547 ± 0.625 , 556 ± 0.62 , and 492 ± 0.72 cells/mm³ respectively.

The monocyte counts show significant variation between healthy fish and those infected with *Aeromonas* across all treatment groups. The *p* - values for the monocyte counts between healthy and *Aeromonas* infected fish were examined in the following treatment groups: control, vitamin C, vitamin E, chitin, chitosan, and levamisole. The *p* - values for these groups were 0.0046, 0.0019, 0.0041, 0.0022, 0.0030, and 0.018, respectively. These results indicate that the tested immunostimulants significantly enhance the monocyte count in both healthy and *Aeromonas* infected fish, as compared to the control feed.

3.7 Erythrocyte sedimentation rate (ESR)

The Table 29 shows the mean ESR values of healthy and *Aeromonas* infected *Catla catla* fish which were treated with different immunostimulant-supplemented feeds. From these results, it was observed that there was no statistically significant variation in the average ESR across the groups being tested. The mean ESR values in healthy fish treated with different immunostimulant mixed feeds ranged from 0.27 ± 0.13 to 0.39 ± 0.17 cm/hour. Whereas, in *Aeromonas* infected fish, the ESR with different immunostimulant mixed feeds vary between 0.33 ± 0.11 and 0.45 ± 0.14 cm/hour.

Table 29 ESR in the fish fed with different immunostimulant mixed feeds under normal and *Aeromonas hydrophila* infected conditions

S. No.	Experimental feed	ESR (cm/hour)		F- value	p -value
		Healthy Fish	<i>Aeromonas</i> infected fish		
1	Control feed	0.39 ± 0.17	0.45 ± 0.14	0.28	0.624 ^{NS}
2	Vitamin C mixed feed	0.33 ± 0.12	0.33 ± 0.11	0.0	1.00 ^{NS}
3	Vitamin E mixed feed	0.27 ± 0.13	0.34 ± 0.15	0.42	0.552 ^{NS}
4	Chitin mixed feed	0.37 ± 0.14	0.43 ± 0.15	0.23	0.656 ^{NS}
5	Chitosan mixed feed	0.35 ± 0.14	0.39 ± 0.17	0.13	0.736 ^{NS}
6	Levamisole mixed feed	0.33 ± 0.13	0.33 ± 1.13	0.0	1.00 ^{NS}

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