

The mean neutrophil counts in healthy fish fed with immunostimulant mixed feed such as control, vitamin C, vitamin E, chitin, chitosan, and levamisole were found to be 2650 ± 0.525 , 2806 ± 0.62 , 3340 ± 0.49 , 3150 ± 0.625 , 2860 ± 0.576 , and 2910 ± 0.672 cells/mm³ respectively. As well as, the mean neutrophil number in *Aeromonas* infected fish fed with immunostimulant mixed feed such as control, vitamin C, vitamin E, chitin, chitosan, and levamisole were found to be 5060 ± 0.89 , 6890 ± 0.77 , 7570 ± 0.62 , 5640 ± 0.525 , 6206 ± 0.765 , and 7100 ± 1.030 cells/mm³ respectively.

The number of neutrophils significantly varies between healthy and *Aeromonas* infected fish from all the treatment groups. The *p* - values of the neutrophil counts between healthy and *Aeromonas* infected fish in the treatment groups of control, vitamin C, vitamin E, chitin, chitosan, and levamisole were measured as 0.043, 0.0020, 0.00046, 0.0061, 0.0037, and 0.0041 respectively. These results demonstrated that the tested immunostimulants significantly increased the neutrophils content in both healthy and *Aeromonas* infected fish when compared to the control.

3.6.4 Lymphocytes

The Table 27, presents the mean lymphocyte counts of healthy and *Aeromonas*-infected *Catla catla* fish that were given various immunostimulant-mixed feeds, along with a control feed. Based on these findings, it was noted that the average lymphocyte counts in all the test groups, with the exception of the chitosan mixed diet group, showed significant variation. The mean lymphocyte counts in healthy fish that treated with different immunostimulant mixed feeds ranged from 2531 ± 0.79 to 3072 ± 0.99 cells/mm³. Whereas, in *Aeromonas*-infected fish, the lymphocyte counts varied between 2290 ± 1.095 and 2740 ± 1.270 cells/mm³ with the use of different immunostimulant mixed feeds.

Table 27 Lymphocyte counts in the fish fed with different immunostimulant mixed feeds under normal and *Aeromonas hydrophila* infected conditions

S. No.	Experimental feed	Lymphocytes (cells/mm ³)		F - value	<i>p</i> - value
		Healthy fish	<i>Aeromonas</i> infected fish		
1	Control feed	2531 ± 0.79	2229 ± 1.095	14.92	0.018*
2	Vitamin C mixed feed	2745 ± 0.87	2459 ± 1.046	13.3	0.021*
3	Vitamin E mixed feed	3072 ± 0.99	2740 ± 1.270	12.7	0.023*
4	Chitin mixed feed	2629 ± 0.92	2353 ± 1.084	11.28	0.028*
5	Chitosan mixed feed	2544 ± 1.17	2360 ± 1.06	4.03	0.115 ^{NS}
6	Levamisole mixed feed	2850 ± 0.89	2553 ± 1.22	11.6	0.027*

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

The average lymphocyte counts in healthy fish that were fed with different types of immunostimulant mixed feeds including control, vitamin C, vitamin E, chitin, chitosan, and levamisole, were measured to be 2531 ± 0.79 , 2531 ± 0.79 , 3072 ± 0.99 , 2629 ± 0.92 , 2544 ± 1.17 , and 2850 ± 0.89 cells/mm³ respectively. As well as, the mean counts of lymphocytes in *Aeromonas* infected fish that were fed with different types of immunostimulant mixed feeds including control, vitamin C, vitamin E, chitin, chitosan, and levamisole were reported to be 2229 ± 1.095 , 2459 ± 1.046 , 2740 ± 1.270 , 2353 ± 1.084 , 2360 ± 1.06 , and 2553 ± 1.22 cells/mm³ respectively.

The number of lymphocytes shows considerable variation between healthy fish and those infected with *Aeromonas* across all treatment groups. The *p* - values for the lymphocyte counts between healthy and *Aeromonas* infected fish in the treatment groups of control, vitamin C, vitamin E, chitin, chitosan, and levamisole were 0.018, 0.021, 0.023, 0.028, 0.115, and 0.027 respectively. These results indicated that the tested immunostimulants had a substantial effect on increasing significantly the number of lymphocytes in both healthy and *Aeromonas* infected fish when compared to the control control-fed group.