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Research Article

COMPARSION OF GROWTH INDICES, SOME BLOOD PARAMETERS AND IMMUNE SYSTEM AMONG JUVENILE RAINBOW TROUT FISHES (*ONCORHYNCHUS MYKISS*) FED UP WITH DIFFERENT LEVELS OF PREBIOTIC OF YEAST CELL WALL (*SACCHAROMYCES CEREVISIA*)

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ABSTRACT
Nowadays the main problem of business aquaculturing is improvement of formulated nutrition for increasing growth and enhancement of fishes' health. This research has been done in order to consider the effect of prebiotic (*saccharomyces cerevisia*) added to nutrition at different levels on juvenile fingerling rainbow trout. After a week of compatibility with growing condition 120 rainbow trout with average weight of 3.61±0.12 distributed randomly into 12 pool with 100 liters volume and density of 10 piece in each pool in the form of 4 treat of 1% prebiotics, 1.5% of prebiotics, 2% of prebiotics and control group without feeding up with prebiotics and with 3 repeat. In this research growth indices, hematology and immune factors in a pattern have been evaluated. At the end of a period parameters of body weight increase, food conversion coefficient, especial growth indices, daily average growth, in 2% treatment have had significant difference with control and other treatments ($p<0.05$). Growth indices such as final length and weight, survival, obesity coefficient in treatments had significant difference toward control group ($p>0.05$). In considering some hematological indices such as the degree of white cell, red cell, hemoglobulin and hematocrit and the degree of neutrophil significant statistical difference has been observed between 2% treatment and other treatments and control group ($p<0.05$). In factors of red cell volume mean, hemoglobin concentration mean, red cell hemoglobin mean and other hematological factors significant difference hasn't been observed in treatments ($p>0.05$). Regarding immune factors the degree of lysozyme, total immunoglobulin and IgM significant statistical difference has been observed at 2% treatment with control group and other treatments ($p<0.05$). Therefore regarding the results and positive effect of yeast cell wall on growth process, hematological and immune indices of juvenile rainbow trout, we can suggest 2% doze of yeast cell wall at nutrition of these fishes.

Keywords: *Rainbow Trout (Oncorhynchus mykiss), Prebiotics, Yeast Cell Wall (Saccharomyces cerevisia), Growth Indices, Blood Parameters, Immune System, Nutrition*

INTRODUCTION
Rainbow trout fish (*Oncorhynchus mykiss)* was a specious with high business value that different diseases such as bacterial infective diseases in most culturing farms is one of main reasons for decreasing the degree of its production. The condition of culturing fishes in primitive steps of culturing has significant effect at success or failure of culturing (Ghosh *et al.*, 2002). Now the main challenge at business aquacultuiring is improvement of formulated nutrition for optimizing growth and enhancing fish's health. Nowadays using nutrition that have function at enhancing immune system is the strategy that besides supplying necessary nutrition for supporting growth of aquatic organism can be beneficial at increasing health, resistance against stress and pathogens (Torrecillas *et al.*, 2010). In this relation ingredients that are used are prebiotics. Prebiotics are indigestible nutrition (carbohydrate) that have beneficial effect on host and improve its health through growth or activating limited number of bacteries specious that exist at intestine (Gibson and Roberfroid, 1995). Prebiotics of yeast cell wall is in fact extracted cell wall from yeast *Saccharomyces cerevisia.*Yeast cell wall is the origin of two important matters of immunostimulant named β-Glucan(1→3) and Mannan Oligosaccharide or (MOS) (EL-Boshy *et al.*, 2010). β-Glucan can

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acts reducer of stress and growth stimulator and make high resistance against pathogens leading to reduction of mortality in fishes. Researchers showed that the degree of effect of Glucan on growth depends on its percentage in nutrition, time of feeding and also the type of studying specious (Ai *et al.*, 2007; Sakai, 1999). Also β-Glucan causes increase of strange cells phagocytes such as neutrophils, macrophages, interferon, and lysozyme and finally increasing immune system of body cells (Cuesta *et al.*, 2004). Studies of researchers shows that Mannan Oligosaccharide causes increase of survival and efficiency of nutrition, improvement of growth performance at different specious of aquatics (Merrifield *et al.*, 2010; Ringo *et al.*, 2010).

During a study the effect of prebiotic of yeast cell wall on factors of growth, blood and immune of juvenile fish of *Cyrinus Carpio* was considered. This prebiotic was added at 3 levels of 1,2 and 3% to the nutrition of fishes during 8 weeks. At the end of the period factors of growth, blood and immune showed significant growth at 3% treatment (Mizani, 2011).

In a consideration levels of 1, 2, 3% inulin prebiotic has been tested in nutrition of rainbow trout. After 8 weeks nutrition didn't show significant difference with control group about the degree of activity of enzymes of blood serum in treatments ($p>0.05$). Using lower levels of prebiotics was advised (Akrami *et al.*, 2007). Also in other research levels of 0, 0.5,1 and 1.5% prebiotic of cell wall of yeast *Saccharomyces Cerevisiae* in nutrition of fishes was considered. After 8 weeks of feeding the effect of this prebiotic on parameters of growth, blood and immune was considered. The result showed that in treatment 1.5% factors of growth, blood and parameters of immune has improved (Ashourpour, 2011).

The effect of levels of 1,5 and 10% of gr×kg of brewer yeast (*S.cerevisiae*) in nutrition of sea bream(*Sparus aurata*) on the degree of IgM of blood serum was tested and observed that yeast due to having β-glucan increases exclusive immune system and IgM in this fish (Cuesta *et al.*, 2004). Juvenile fishes (*Labeo rohita)* Rohu were tested with nutrition of 0,5,7.5 and 10 percent yeast of bread for 8 weeks and the result showed that not only they have better growth than control group but also as an immunostimulant that support immune reactions (Tewary and Patra, 2011). Therefore the aim this study is creating proper conditions at growth, survival, immune enhancement, proper levels at blood indices and proper conditions at primitive steps of growth of rainbow trout and also determining effective level of prebiotic of yeast cell wall added to nutrition of rainbow trout at the process of their immune and health.

MATERIALS AND METHODS

This research has been done at the farm of culturing rainbow trout fishes belonged to the company of shafagh Darooye parsian located in Somesara city for 8 weeks in 2012. For doing the research rainbow trout fishes after a week of compatibility to the farm condition, 120 pieces with average weight of 3.6±0.12 and density of 10 pieces in each pool with 100 liters volume were released. The research was done with 4 treatment and 3 repeats in 12 Fiberglass pool each having 100 liters water. During the research waste and water wastes were taken from each tank daily. In this consideration treatments including nutrition having 1%, 1.5% and 2% prebiotic of yeast cell wall and control treatment (without adding prebiotics to the nutrition) and each one were tested in 3 repeats. For supplying considered nutrition firstly food was grinned and after calculating and adding considered prebiotics with mixer device (blender) it was changed to paste based on consumption amount by adding water and then was grinded to the shape of pasta string and finally pellet were put into an oven (Binder, Germany) at the temperature of 30 centigrade degree for 24 hours in order to be dried and then pellets were created from those strings fitting to diameter of the mouth of fishes mouth and were kept in proper and impenetrable bags at the temperature of -15 centigrade degree One hour before food distribution in pools, the prepared food were exited form fridge and kept at the temperature of room and after balancing pellets temperature, they were weighed by digital scale with 0.01% gr accuracy (Shinko Radwag model WTB made in Japan) and regarding considered treatment, they were fed up based on observations and nutritional behavior of juvenile rainbow trout 3 times a day at (8,14,20 o'clock) every day to the amount of 3-5% of their body weight. This action was done day and night at regular turns based on water temperature, fish weight, and biomass and biometric of each repeat once in every 2 weeks. Food making was done for preventing

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reduction of its quality every month. In fact fishes were fed up for 8 weeks and the operation of calculating the degree and percent of food was done based on biomass measurement at the beginning of period with 5% live mass in each treatment and at the end of each period with 3% live mass manually (Pourali *et al.,* 2003; Sodagar *et al.,* 2005; Mohseni *et al.,* 2006). Qualitative parameters of water like soluble oxygen was measured by oxygen meter WTW model 330i made by Weilheim company in Germany with 0.01 accuracy, and tempratire was measured by digital thermometer 300 made by HM company in South korea daily. After the end of culturing period for consideration of the effect of prebiotic at improvement of blood and immune indices after 24 hours 3 ones were randomly chosen from each treatment and repeat and taking blood was done from vessel of caudal vein by 2cc syringe. During the process of blood taking anesthetic material hasn't been used due to the probability of effect of blood indices (Torrecillas *et al.,* 2010). Samples for determining immune levels, blood indices and differential diagnosis of white cells of fishes were transferred to clinical laboratory. The volume of taken blood per each repeat was 1cc that 0.5cc was poured into eppendrof without heparin for separating blood serum and 0.5cc having heparin (Tewary and Patra, 2011). Before doing each step of biometry, juvenile fishes were kept hungry for 24 hours in advance to empty their gastrointestinal tract (Hosseinifar *et al.,* 2010; Ebrahimi *et al.,* 2004). Also for determining live mass (biomass) in each pool, the weight of 20 percent of fishes of each pool was measured by digital balance with accuracy of 0.01gr and with standard ruler their length was measured with accuracy of 1mm every each 15 days and registered.

Indices of growth such as weight and total length, percentage of body weight initial (BWI), food conversion ratio (FCR), special growth rate (SGR), average daily growth (ADG), coefficient of fatness (CF), survival rate (SR) were measured.

For measuring Ig Elisa method was used. Applied device was (Awareness, USA) model Stat Fax-2100. The amount of total immunoglobulin with protein obtained from blood serum that was centrifuged by poly ethylene glycol was obtained based on (mg/ml) (Torrecillas *et al.,* 2010; Huang *et al.,* 1989).

Applied method for measuring immunoglobulin M is Nephelometry method. In this method IgM of blood forms a complex with polyclonal antibody available in tampon solution and causes turbid solution. The severity of turbidity has direct relationship with IgM and is read by spectrophotometer (Minineph made by UK) at wave length of 340 nm. In fact nephelometer of monochromatic light at wave length of 400-800 nm is radiated to the solution that after colliding to the complex, antibody and antigen are separated that the degree of dispersion has direct relationship with amount of IgM (Khoshbavar-Rostami *et al.,* 2003; Sagha and Soroushnia, 2003; Zilva and Pannall, 1984).

After measuring the degree of lysozyme activity the device Elisa Reader (awareness, USA) model stat Fax-2100 and through turbid metric method have been used. The result was obtained through positive warm bacteria and based on (mg/ml^{-1}) (Malin *et al.,* 1996). At the end all raw data for considering normal distribution of data in groups and repeats for conforming treatments Shapiro-Wilk test and histogram table design were used. For comparing means of groups together Dancan test with 0.5% certainty was used. All statistical analysis by using Spss software version 17 and for designing charts Excel 2003 was used.

RESULTS AND DISCUSSION

Results

Based on daily measurement physical and chemical factors of water were average temperature during culturing period was 17.75±3.11centigrad degree, PH 7.35±0.41, oxygen7.2±1.2 mg×liter and water hardness was 282.5±0.52 mg×liter of calcium carbonate. Regarding the result and statistical analysis at the end of research it was observed that there wasn't statistical significant difference at different treatment groups between growth factors such as weight and final length, coefficient of fatness and percent of survival ($p>0.05$). In between treatment of 1.5% probiotics with 15.37 gr weight had the highest final weight, treatment 1.5% cm the highest final length, treatment 1.5% prebiotic with 0.91 the best situation of coefficient of fatness and treatment 2% with 83.33% had the highest degree of survival (table 1). Also in considering Body weight initial mean (BWI), special growth rate (SGR), Average daily growth rate

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(ADG) and food conversion ratio (FCR) there has been observed significant statistical difference between experimental treatment and control groups ($p<0.05$) (table 1). The highest degree of BWI (399.88 percent) in 2% prebiotic treatment, SGR (2.87 percent) in 2% prebiotic treatment, ADG (7.14 percent) in 2% treatment and FCR (0.78) in 2% treatment have better situation than other treatment group and control group.

Table 1: Comparing average weight and final length, conversion of fatness, survival percent, BWI, SGR, ADG and FCR of rainbow trout at the end of eighth week of feeding with prebiotic of yeast cell wall

Control group		Treat 2%		Treat %1.5		Treat %1		Parameter
SD	Mean	SD	Mean	SD	Mean	SD	Mean	
0.69	14.96	0.36	14.99	0.37	15.37	0.73	14.16	Final weight(gr)
0.03	11.26	0.05	11.4	0.32	11.93	0.30	11.1	Final length(cm)
0.04	1.04	0.04	1.01	0.07	0.91	0.07	1.04	CF(%)
3.33	73.33	3.33	83.33	6.67	76.66	5.77	80	SR(%)
17.83^{a}	315.69	12.02^{b}	399.88	18.73^{a}	298.34	23.29^{a}	277.08	BWI(%day^{-1})
0.08^{a}	2.541	0.04^{b}	2.87	0.08^{a}	2.46	0.11^{a}	2.36	SGR(%day^{-1})
0.32^{a}	5.64	0.21^{b}	7.14	0.33^{a}	5.33	0.42^{a}	4.95	ADG(gr/day)
0.06^{b}	1.07	0.01^{a}	0.78	0.13^{b}	1.02	0.10^{b}	1.13	FCR

(Incommonlatin letters shows significant statistical difference at dunkan test at the level of 5)

Based on the result at the end of research it was observed that considering indices at differential diagnosis of white cells of fishes had significant statistical difference at mean of the number of white cell and neutrophil (table 2). However difference at considering the degree of lymphocyte, monocyte and eosinophil wasn't significant statistically ($p>0.05$). In between 2% treatment as had better situation than other experimental and control groups.

Table 2: Comparing mean of the number of white cells, neutrophil, monocyte, lymphocyte and eosinophil of juvenile rainbow trout at the end of eighth week of feeding with prebiotic of yeast cell wall

Control group		Treat 2%		Treat %1.5		Treat %1		Parameter
SD	Mean	SD	Mean	SD	Mean	SD	Mean	
250^{a}	5250	655.74^{c}	9500	240.16^{b}	7533.33	208.16^{a}	5800	WBC(mm^{3})
1^{a}	20	0.88^{c}	39.33	1.20^{b}	30.33	0.57^{a}	21	Neutrophil (%)
1	78	3.84	50.67	1.15	67	3.28	73.33	Lymphocyte (%)
0.5	1.5	0.57	4	0.33	2.33	0.33	1.66	Monocyte (%)
0.33	0.33	0.33	1.33	0.33	0.33	0.33	0.66	Eosinophil (%)

(*Uncommonlatin letters shows significant statistical difference at dankan test at the level of 5%)*

In consideration of other studying hematological indices in the research and regarding the result of statistical analysis at mean of the number of red cell of juvenile fishes, the degree of hemoglobin and hematocrit significant statistical difference has been observed($p<0.05$)(table 3). However in consideration of the degree of moderate corpuscular volume of blood cell of fishes (MCV), there hasn't been observed significant statistical difference at degree of mean concentration of hemoglobin at red cell(MCH) and mean concentration of hemoglobin of red cell(MCHC)($p>0.05$) (table3). In consideration of other

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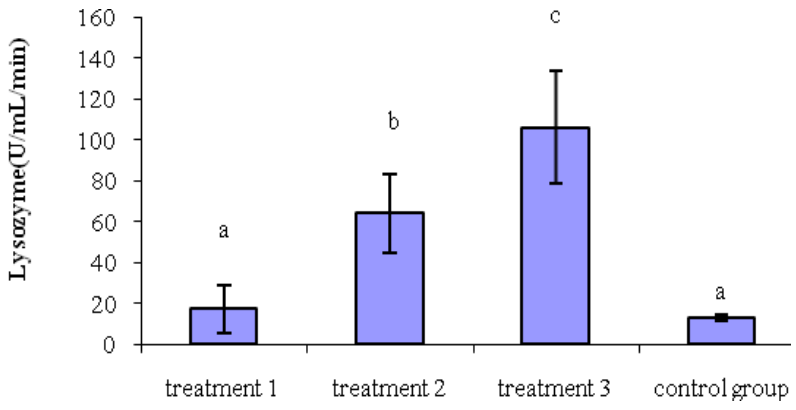
hematological indices in most indices 2% treatment has had better situation than other experimental and control group.

Table 3: Comparing mean of the number of red cells, hemoglobin, hematocrit, MCV, MCH and MCHC of rainbow trout at the end of eighth week of feeding with prebiotic of yeast cell wall

Control group		Treat 2%		Treat %1.5		Treat %1		Parameter
SD	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	
45706.26[a]	541250	39849.72[b]	800000	18036.99[ab]	717000	10837.18[a]	586666.67	RBC(mm^3)
0.2[a]	4.4	0.15[b]	6.5	0.15[b]	6	0.26[a]	4.77	Hemoglobin (gr/dl)
0.5[a]	23.50	1.33[b]	32.67	0.58[b]	30	0.88[a]	23.33	Hematocrit (%)
1.5	414.5	10.39	408.33	5.04	418.33	10.26	397	MCV(fl)
1	82	2.08	81	0.33	83.33	3.84	80.66	MCH(pg)
1	19	0.36	19.9	0.20	19.96	0.43	20.36	MCHC(gr/dl)

(uncommonlatin letters shows significant statistical difference at dankan test at the level of 5%)

In considering the result of statistical analysis there was statistical significant difference between experimental treatment and control group regarding the degree of lysozyme, immunoglobulin M(IgM) and total immunoglobulin (Ig) ($p<0.05$) (shape 1,2,3). The highest degree of lysozyme (106±15.82 U/ml/min), the highest degree of IgM (116.67±19.06 mg×deciliter) and the highest degree of Ig was (22.33±1.85 mg/ml) at 2% treatment.



Shape 1: Comparing lysozyme mean at rainbow trout fed up with prebiotic of yeast cell wall for 8 weeks

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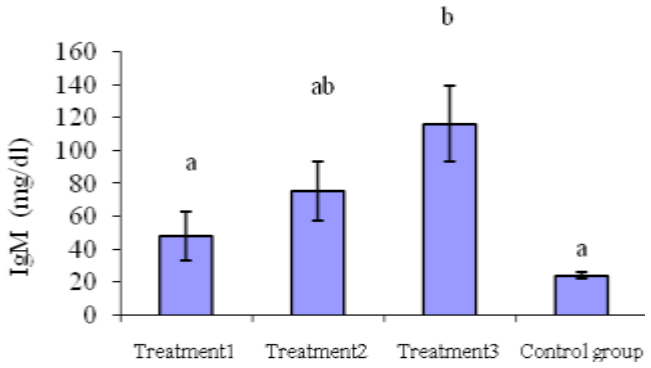
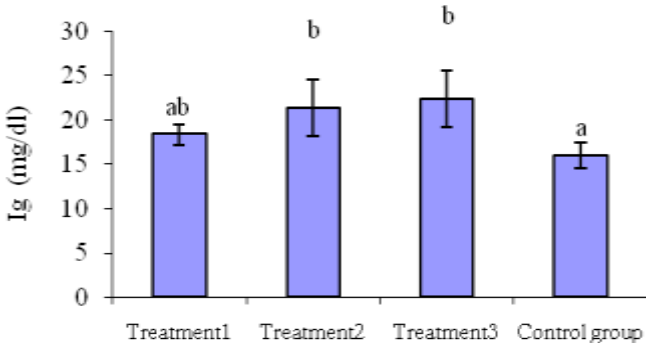


Shape 2: Comparing IgM mean at rainbow trout fed up with prebiotic of yeast cell wall for 8 weeks (uncommonlatin letters shows statistical significant difference at Duncan test at 5% level)



Shape 3: comparing Ig mean at rainbow trout fed up with prebiotics of yeast cell wall for 8 weeks (Uncommonlatin letters shows significant statistical difference at Duncan test at 5 percent level)

Discussion

Regarding the result of this research it was distinguished that due to using prebiotic of cell wall of the yeast *Saccharomyces cerevisia* in treatments besides observing lack of significant statistical difference at weight, final length and coefficient fatness, treatment of 1.5% prebiotic has the highest degree of weight, final length and coefficient fatness. Specious differences of fatness indices are a reflection of fullness of stomach, reproduction situation or nutritional situation (Sarli, 2010). In treatment of 2% prebiotic besides observing significant statistical difference in some parameters of growth such as percent of body weight increase, special growth index, average daily growth and food conversion coefficient have the best situation of treatment growth and also in considering the percent of survival although significant statistical difference hasn't been observed but treatment of 2% prebiotic has the highest degree of survival. Considering the effect of yeast cell wall on growth factor of rainbow trout during a 30 days period showed that there isn't significant difference between coefficient of fatness and survival and final length (Tukmechi *et al.*, 2011). However percent of body increase, especial growth coefficient, has had significant difference with control group that correspond with the findings of this research. Also the most important product resulted from metabolism of prebiotic of fatty acids is short that is absorbed through intestinal epithelium and is known as a source of energy that can streng then enterocyte improve absorption of nutrition and finally the positive effect on growth process (David *et al.*, 1999; Mahious and Fransollevier, 2005; Schley and Field, 2002). Identified reasons about meaninglessness of difference at the degree of survival can be related to the short period of experiment (Rofchaei, 2011). The result of

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current research showed that high levels of yeast increases fish survival percentage although it isn't significant (P>0.05).

Adding strain beer yeast of Ellipsoidues to nutrition of fishes of newborn rainbow didn't have significant effect on growth, survival and efficiency of nutrition (Pooramini and Bastami, 2011). Of course in another study applying levels of 1%, 1.5 percent and 2% Active MOS to nutrition of rainbow trout fishes has shown significant difference at final weight, especial growth, food conversion coefficient and protein efficiency coefficient during 8 weeks (Norozi and Meftah, 2010).

Also in a research it was reported that adding 1%, 2% and 5% levels of the same yeast didn't have any effect on growth factors and similar results hasn't been obtained from adding boulardistrein beer to nutrition of rainbow trout (Aubin *et al.,* 2005). During other studies it was reported that the degree of 0.2%MOS has increased growth and survival of 30gr rainbow trout fishes during 90 (Staykov *et al.,* 2007). Also this prebiotic to the amount of 0.15% has enhanced growth coefficient of the 37.5gr fishes during 90 days significantly but food conversion coefficient didn't have significant difference with control group (Yilmaz *et al.,* 2007).

In current research we see significant difference at total number of white cel that with increase of the amount of prebiotic doze (2%) this amount became more and control treatment has the least number of white cell and this denotes stimulation of immune system and its enhancement. The number of white cells and ration of its types is one important index of health and situation of immune system (Shalaby *et al.,* 2006).

Regarding the result if the research significant statistical difference hasn't been observed among different white cells (lymphocyte, monocyte and eosinophil) in treatments with control group (p>0.05).However regarding neutrophil mean among treatments significant statistical increase toward control group was observed that can show the positive effect of this group of granulocyte at nonspecific immune and inflammatory response and in fact these cells are more phagocytic than other granocytes. The main activity of neutrophils is doing active phagocytosis action (Kazemi *et al.,* 2010). In fact all prebiotic diseases have more number of neutrophils in comparison to control group that this amount in 2% treatment is more than other groups. Also the amount of lymphocyte in control group is more than other treatments this is due to chronic stress or power of factors creating nonspecific immune (so that more production of lymphocyte is not needed). Phagocytosis power of eosinophil in comparison to neutrophil cells was less but have important function at removing tissue parasites (Kazemi *et al.,* 2010). The degree of eosinophil in treatment 3(2%) had the highest degree. As it was observed from the result, treatments fed up with this prebiotics had meaningless increase at white cells of phagocytosis than control treatment that causes increase of phagocytosis and stimulation of nonspecific immune system among fishes. Parameters of hematology are affected by environmental and biologic factors so awareness of the effect of mentioned factors on parameters of pathology is necessary at interpretation (Luskova, 1998).

The number of red cell in 2% treatment had significant difference with control and 1% treatment that shows the effect of this prebiotic at improvement of taking oxygen to tissues and the process of metabolism and transference of Co_2 to outside body (Kazemi *et al.,* 2010). Since hemoglobin is a protein that constitutes 95 percent of red cell, the result of hemoglobin corresponds with the number of red cell (Welker *et al.,* 2007). Hematocrit is a function of red cell and has direct relationship with it (Tangestani *et al.,* 2011). The degree of hematocrit in control group has created significant difference with other treatments that it can be concluded that matters of immune stimulator can have significant effect on hematologic indices (Tangestani *et al.,* 2011). Indices of MCV, MCH, MCHC, didn't show significant changes in treatments (p>0.05). Indices of mean of red cell volume (MCV) in treatments fed up with prebiotic of yeast cell has had falling process than control group that reduction of red cell volume shows lack of inflammation that facilitate movement and suspension of red cells and speed of their sedimentation and reduces conformation of clot in vein that is counted as a positive characteristics at physiology of blood circulatory system. However as it was observed from the result, the degree of hemoglobin in red cell (MCH) at treatments having prebiotic has increased that shows positive effect of prebiotic on hemoglobin and the capability of transferring respiratory gas by hemoglobin (Tangestani *et*

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al., 2011). Based on the result the degree of lymphocyte didn't have significant statistical difference with control group and immunoglobulin (Ig) and immunoglobulin M(IgM) didn't have significant statistical difference between treatments and control group($P<0.05$).In fact the effect of β-glutan extracted from yeast cell wall caused increase of immune activity at treatments fed up with this prebiotic.

During a study the effect of yeast cell wall on blood factors of rainbow trout has been considered over a 30 days period and it was observed that neutrophil, lymphocyte, monocyte, degree of lysozyme, Ig, number or white cell, number of red cell, hematocrit and hemoglobin at treatments having cell wall of beer yeast at nutrition didn't have significant difference with control nutrition that correspond to the result of current research except number of white cells and neutrophil mean (Tukmechi *et al.*, 2011). This difference is related to the difference at type of specious, consumable nutrition, length of period and effect of environmental factors on hematological parameters (Luskova, 1998). In a research the effect of levels of 100, 250, 500 mg×kg β-glucan on systems of immunity, growth and survival of fingerling fishes of *Labeo rohita* has been studied and it was proved that 3 times injection, 1mg per body weight of β-glucan enhance immune system and increase resistance against bacteria of *Aeromonas hydrophilla* and *Edwardsiella tarda* (Misra *et al.*, 2006). Also adding MOS to nutrition had different effects on various fishes (Ringo *et al.*, 2010). In catfish channel of immune factors and hematology and resistance against *Edwardsiella ictaluri* didn't have significant difference with control group (Welker *et al.*, 2007). However in rainbow trout activity of lysozyme and antibody increased significantly (Staykov *et al.*, 2007).

The activity of lysozyme is as an important introducer of nonspecific immunity in fishes (Sakai, 1999). Its increase after consumption of stimulating matters of immunity like glucan and antigen stimulation increases (Soltani, 2008).

The degree of activity of lysozyme in treatment 3(2%) prebiotic has jad significant difference that control that it can interpret its reason in this way that the origin of the highest amount of productive lysozyme is from neutrophil and monocyte as it is obvious from the result the highest amount of this phagocytic cells exist in 2% treatment and also β-glucan and Mannan oligosaccharide affect activity of lysozyme based on some reports (Ringo *et al.*, 2010; Dalmo and Bogwald, 2008). During a research on usual fingerling carp fishes fed up with different levels of prebiotic of yeast cell wall, most growth factors such as especial growth indices, daily growth mean, food conversion ratio, length and final weight between experimental treatment and control treatment didn't have significant statistical difference. However at percentage of survival significant statistical difference has been observed between treatments and control treatment. Also blood and immunity indices such as lysozyme, Ig, IgM have been considered and the result showed that increase of this prebiotic at 3% level of nutrition can increase immunity level at juvenile carp fishes and in treatments except eosinophil mean significant statistical difference has been observed ($p<0.05$) (Mizani, 2011). Also in a research the effect of beer yeast at 0, 1, 2 percent of nutrition on *Huso huso* on hematological factors has been considered for 60 days and it was distinguished that there hasn't been observed significant statistical difference at the degree of hemoglobin, hematocrit, MCH, MCV, MCHC and differential diagnosis of white cell, glucose and total protein between treatments and control group that some of them correspond to the findings of the research (Hoseinifar *et al.*, 2011).

Result of current research shows that increase of prebiotic of yeast cell wall at 2% level of nutrition rainbow trout can increase immune indices such as lysozyme, Ig, IgM and positive effect on differential indices of white cell and improvement of hematological indices that stimulates immune system of these fishes. However using yeast cell wall for enhancement of growth indices of fishes needs more studies on different specious of fishes to be able to interpret contradictory results. Totally differences at the result of this research with findings of other researchers can be related to environmental factors especially cold-bloodiness of fishes such as (seasons, years, salinity, light period, temperature, density),physiological factors(aquatic specious, reproduction cycle and maturity situation, age, gender and nutritional conditions) genetic, sampling time, formulation of nutrition, type of prebiotic, its purity degree and the degree of consumption at nutrition, different methods of adding to nutrition, accuracy and sensitivity of measuring methods. Therefore these factors besides the effect on activity of growth indices and hematological and immune factors can cause difference at interpretation of result of researchers (Akrami

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et al., 2010; Verdegem *et al.*, 1997). Regarding improvement and increasing parameters considered, in treatment 3 of the research we can suggest 2% doze of yeast cell wall at nutrition of fingerling rainbow trout. Therefore we can explain using this product economically and probably it is suitable for improvement of growth and health of aquatic organism at intensive culturing. Also in other research considering the effect of this prebiotic and other prebiotics, extraction and purifying glucan and mannan oligosaccharide, purifying them from other natural matters, their application at growing other aquatics and effects of prebiotic at different rainbow trout and other economic fishes can be suggested.

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