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RANKING OF PROVINCES IN TURKEY ACCORDING TO NUMBERS OF ANIMALS THROUGH FACTOR ANALYSIS

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ABSTRACT

In this study, the level of development of provinces in Turkey in regard to numbers of animals were investigated through factor analysis. A total of 13 animal typesin 81 provinces were investigated in the scope of the study. Kaiser-Mayer-Olkin (KMO) coefficient of factor analysis was identified as 0.617 and Bartlett global test significance value was identified as 0.000.Accordingly, the data set was appreciated as suitable for factor analysis.4 factors, eigenvalues of which were greater than 1 were identified in factor analysis. The sum of the variance percentages of these factors were calculated as 75.525.The variables were assigned to the appropriate factors by using varimax rotation. The factor scores were used to identify the best and worst provinces in respect of the numbers of animals. According to the first factor; Kars, Erzurum and Konya; according to the second factor(buffalo and duck) Samsun, Diyarbakir and Istanbul; according to the third factor (chicken and turkey) Manisa, Bolu and Balıkesir; according to the fourth factor (goats and mules) Siirt, Mardin and Mersin provinces are the most advanced provinces.

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INTRODUCTION

Along with increasing of the world'spopulation, the effect of the phenomenon of globalization on countries increased and differences of competition has become quite evident. The superiorities of countries over each other could be identified with their economic level. The economic indicators provide information about the level of development of countries. Husbandry; which is a section of agriculture, an indicator of economy,witheconomicfunctionsinrespectofboth international, national and regional development; preventing hidden unemployment in the countryside; providing resource transfer to industry, is an important section of industry. Due to the fact that food substances, necessary for healthy nourishment, have been supplied through animal production, it is quite evident how important the policies to be followed for purpose of development of husbandry are. With increase of the population in Turkey, consumption of animal products increased as well, demand for animal product couldn't be met and the husbandry couldn't develop at the desired level. Some of reasons for failing to develop at the desired level are insufficient organization, majority of small family business, excessive migration from rural to urban, lack of effective pasture management, that livestock breeders stay connected to traditional methods, low productivity per animal, wrong policies followed in respect of husbandry, failure in allocation to husbandry in the same rate supplied to another industrial fields by government. According to the statistics of The United Nations food and Agriculture Organization (FAO) in the year 2013, the world's most cattle breeding has been carried out in Brazil with 211 764 292 pieces. This country has been followed respectively by India with 189 0000 000 pieces and China with 113 644 709 pieces. The total number of cattle in the world is 1 467 548 724 pieces. Turkey has fallen within 21st order with cattle of 13 916900 pieces in the world(FAO, 2013). The most buffalo breeding has been carried out in India with 115 420 000 pieces in the year 2013. This country has been followed respectively by Pakistan with 33 700 000 pieces and China with 23 253 900 pieces. The total number of buffaloes in the world is 199 784 000 pieces. The total number of goats in the world is 1 005 600 000 pieces. Turkey has fallen within 22ndorder with goat production of8 357 290pieces in the world. The total number of sheep in the world is1 172 830 000pieces. Turkey has fallen within 9th order with sheep production of27 425 200piecesin the world. The total number of goats in the world is 1 005 600 000 pieces. Turkey has fallen within 22nd order with goat production of 8 357

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290pieces in the world. The total number of sheep in the world is1 172 830 000pieces. Turkey has fallen within 9th order with sheep production of27 425 200piecesin the world (FAO, 2013).In the year 2012, Turkey has fallen within 20th order with buffalo of107 435piecesin the world. According to the TSI records; the number of cattle is 14 122 847, the number of buffalo is 121 826, the number of sheep is 31 115 190, the number of goat is 10 347 159 in the year 2014 (TSI, 2014).

Dagistan *et al*. (2008) identified through factor analysis that the main factors that affect the success of the business of sheep raising were business size, profitability, feed input, unit costs, land, labor productivity, and grazing duration. Cankayaet al. (2009) guessed live weight of Karakaya sheep through multiple regression model using the scores of factor analysis. They implied that the results that they attained were more reliable than the regression model results attained with LSM. It was intended in this study to reveal the development of provinces in respect of husbandry by investigating the presence of animals in Turkey through factor analysis, which is one of the multivariate statistical methods.

MATERIALS AND METHODS

In the study, the data including the number of animals raised in the year 2014 in 81 provinces were used. The data was supplied from www.tuik.gov.tr web site of Turkey Statistical Institute (TSI).The number of cattle, adult cattle, buffalo, adult buffalo, sheep, goat, chicken, turkey, goose, duck, horses, mule and donkey were considered as animal material in the study. A total of 13 variables were discussed considering every number of animal as a variable. SPSS statistical package program.22.0 was used in the data analysis. Factor analysis is a multivariate statistical technique, which serve getting a small number of unrelated variable by putting interrelated variables in many data together. Since a large number of variables are in tented to be represent by a smaller number of factors in factor analysis, primarily, cross-correlations of variables are considered (Johnson and Wichern, 1992). Factor analysis serves the aim of dimension reduction and elimination of dependency structure and intends getting a small number of new unrelated variable(common) by putting interrelated variables together in a set of p-variables (Tatlıdil, 2002).

Factor analysis intends ro reveal random factors that are not being monitoredand emerging after putting p variables together that are being monitored and included in x data matrixand between which, cross correlation exist;and representing the variables group. These newly derived latent variables are called as factor (Ozdamar, 2013).Factor analysis is the total of multivariate methods, very difficult to explain, intending to find a small number of significant and independent new variables, that is to say, factors in many interrelated variables, with least information loss (Alpar, 2011).Regarding sample size, the numbers of 50,100,200,300,500 and 1000 respectively represent; very weak, weak, medium, good, very good, excellent (Tavsancil, 2002).

While factor analysis is carried out; evaluation of the suitability of the data, attainment of factors, factors rotation, and denomination of factors are performed. With the intent of evaluating compliance of the data set, correlation matrix is constituted and Kaiser-Meyer-Olkin (KMO) and Bartlett tests are performed (Akgul and Cevik, 2003).In calculation of correlation matrix, the variables with high correlation relationship will be included in the same factorin general (Nakip 2003). In order to decide whether factor analysis will be applied, Kaiser-Mayer-Olkin (KMO) test is performed. KMO test has been calculated by comparing the correlation coefficients calculated as shown in equation (1) to the correlation coefficients of partial correlation. The test value varies between 0 and 1 (Norusisand SPSS Inc, 1994).

$$KMO = \frac{\sum\sum_{i \neq j} r_{ij}^2}{\sum\sum_{i \neq j} r_{ij}^2 + \sum\sum_{i \neq j} a_{ij}^2} \quad (1)$$

In this equation; KMO represents Kaiser-Mayer-Olkin sample compliance test; r_{ij} represents correlation coefficient between ith and jth variables; a_{ij} represents partial correlation coefficient between ith and jth variables. If the value resulted from KMO test is below 0, 50, it is unaccepTable, if equals to 0.50, it is weak; 0.60, medium; 0.70, good; 0.80, very good; 0.90, excellent (Sharma, 1996). Bartlett test of sphericityis used for the applicability of factor analysis as well. Bartlett's test(Bartlett Test of Sphericity) is used to testif correlation matrix is a unit matrix, that is to say, its all diagonal terms are 1 and its all non-diagonal terms are 0.This test requires that all data aregenerated through multiple normal distribution(Hair et. al., 1998). In determination of number of factor, eigenvalues, scree testchart criteria and criterion of variance have been widely used.In determination according to eigenvalues, the factors with eigenvalues greater than 1 are generated (Mucuk 1978).In screet test criterion, chart of eigenvalues is studied and the factors ranging to the point where vertical line becomes horizontal, are included in solution (Lewis 1994).The cumulative variance value is taken into account in variance criterion. The cumulative variance value should describe the generated factors sufficiently. Commonality is the variance margin of any variable described by all factors.If commonality (h^2) and cumulative variance are greater, that implies that model is appropriate (Ness, 2000). Rotation operations are required so as to explain the factors. The most commonly used method of vertical rotation is varimax method (Kleinbaum et. al, 1994).In varimax method,while some factor loads approach to 1, a large number of remaining value approach to 0.In this method proposed by Kaiser (1958), rotation is fulfilled so as to factor variances will be maximum (Cokluket al. 2010).The operation that makes factor variances maximum in the varimax method has been given no (2) equation (Tatlıdil, 2002).

$$\text{Max } V = p\sum_{l=1}^{m}\sum_{j=1}^{p}(d_{jl}/h_j)^4 - \sum_{l=1}^{m}\left(\sum_{j=1}^{p} d_{jl}^2/h_j^2\right)^2 \quad (2)$$

Here, d_{jl} :factor matrix obtained in consequnce of rotation h_j^2 :common variance.

RESULTS AND DISCUSSION

In order to apply factor analysis and obtain reliable results, sample adequacy criterion was reviewed before analysis was contucted. Kaiser-Meyer-Olkin (KMO) criteria specifies the

common amount of variance created by variables. If this value close to 1, it implies that the data are suitable for the factor analysis, if it is below 0.50, it implies that the data aren't suitable for the factor analysis. In this study, KMO scale was found as 0.617 implying that sample size was sufficient. According to Bartlett test of sphericity, it was found that test was statistically significant ($p < 0.001$). For this reason, factor analysis can be applied to the data used in the study.

Table1. KMO and Bartlett's Test

Kaiser-Meyer-OlkinMeasure of SamplingAdequacy.		0.617
Bartlett's Test of Sphericity	Approx. Chi-Square	1237.097
	df	78
	Sig.	0.000

The factor rotation was doneso as to explain the factors. The varimax method was preferred for varimax rotation (Albayrak, 2006).Resulting the rotate factor loads matrix constituting from 13 items and 4 factors is given in Table 3.

According to the results given in Table 3, there are 6 variables with greater correlation in the first factor. In other words, 6 type of animals are available with greatest explanatory power. These animals consist of adult cattle (0.869), cattle (0.856), horse (0.839), goose (0. 694), donkey (0.581) and sheep (0.543). Various animal types, such as, bovine, ovine, single quoted and poultry are present in this group of animals. The second factor consists of adult buffalo (0.976), buffalo (0975) and duck (0.498). For this reason, it can be called as "buffalo and duck" factor considering variable structure and factor loadings. The third factor consists of a group of poultry including chicken (0.950) and turkey (0.882). Therefore, this factor could be called "poultry" factor. The fourth factor consisting of goat (0.839) and mule (0.791) is "goats and mules" factor because of their shares in production. The development of provinces in respect of animal data has been given in order, from high to low, according to the factor scores for each factor. The factor scores regarding the first, second, third and fourth factors have been given respectively in Table4, Table5, Table6 and Table7. When the scores were examined according to the first factor (adult cattle, cattle, horse, goose, donkey and sheep), Kars has fallen within 1st order with 4.99972 factor score, Erzurum, 2nd order with 2.7928 factor score, Konya, 3th order with 2.25624 factor score.

Table 2. Total VarianceExplained

Component	InitialEigenvalues			ExtractionSums of SquaredLoadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.164	32.028	32.028	4.164	32.028	32.028
2	2.156	16.588	48.616	2.156	16.588	48.616
3	1.816	13.967	62.583	1.816	13.967	62.583
4	1.683	12.942	75.525	1.683	12.942	75.525
5	0.868	6.680	82.205			
6	0.658	5.065	87.270			
7	0.625	4.805	92.075			
8	0.397	3.051	95.126			
9	0.302	2.324	97.450			
10	0.205	1.574	99.024			
11	0.124	0.951	99.975			
12	0.002	0.017	99.992			
13	0.001	0.008	100.000			

ExtractionMethod: Principal Component Analysis.

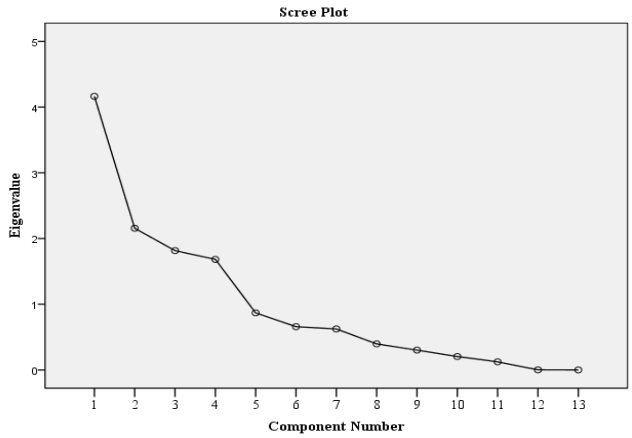

Figure 1. The graph used to determine the number of factors

Tablo 3. Rotated Component Matrix[a]

	Component			
	1	2	3	4
Adult cattle	0.869	0.153	0.300	0.037
Cattle	0.856	0.159	0.320	0.042
Horse	0.839	-0.091	-0.044	0.100
Goose	0.694	0.047	-0.211	-0.276
Donkey	0.581	0.233	0.081	0.479
Sheep	0.543	-0.077	0.159	0.481
Adult buffalo	0.028	0.976	-0.018	0.023
Buffalo	0.025	0.975	-0.016	0.010
Duck	0.371	0.498	0.336	0.076
Chicken	0.065	0.038	0.950	-0.009
Turkey	0.110	0.003	0.882	0.010
Goat	0.048	-0.144	0.107	0.839
Mule	-0.080	0.234	-0.197	0.791

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

Table 4.Ordering the provinces in Turkey according to the first factor scores

Number	Provinces	Factor Scores	Number	Provinces	Factor Scores
1	Kars	4.99972	42	Tekirdağ	-0.24042
2	Erzurum	2.7928	43	Malatya	-0.27064
3	Konya	2.25624	44	Uşak	-0.32407
4	Ardahan	2.1969	45	Antalya	-0.36703
5	Şanlıurfa	1.81216	46	Kırşehir	-0.37224
6	İzmir	1.78803	47	Çankırı	-0.38455
7	Balıkesir	1.62962	48	Isparta	-0.39116
8	Muş	1.48587	49	Ordu	-0.43625
9	Ağrı	1.43709	50	Manisa	-0.44262
10	Van	1.43229	51	Batman	-0.44276
11	Aydın	0.94119	52	Amasya	-0.44637
12	Afyon	0.86926	53	Sinop	-0.45429
13	Sivas	0.65882	54	Erzincan	-0.48491
14	Ankara	0.47612	55	Trabzon	-0.49319
15	Diyarbakır	0.43364	56	Karaman	-0.49685
16	Kayseri	0.34033	57	Nevşehir	-0.56134
17	Kütahya	0.33491	58	Bartın	-0.57491
18	Tokat	0.22172	59	Kilis	-0.61058
19	Çanakkale	0.20854	60	Sakarya	-0.66951
20	Çorum	0.20067	61	Mersin	-0.67287
21	Denizli	0.19707	62	Osmaniye	-0.67705
22	Eskişehir	0.15091	63	Artvin	-0.71761
23	Kahramanmaraş	0.13608	64	Kırıkkale	-0.72549
24	Muğla	0.08405	65	Kocaeli	-0.7313
25	Iğdır	0.07505	66	Hakkari	-0.73514
26	Samsun	0.06934	67	Yalova	-0.73816
27	Yozgat	0.06529	68	Tunceli	-0.75622
28	Bursa	0.00195	69	Bitlis	-0.82905
29	Aksaray	-0.02804	70	Bilecik	-0.83171
30	Elazığ	-0.03652	71	İstanbul	-0.84642
31	Gaziantep	-0.04752	72	Karabük	-0.85656
32	Edirne	-0.06646	73	Siirt	-0.86446
33	Kastamonu	-0.07737	74	Zonguldak	-0.87004
34	Adana	-0.08715	75	Giresun	-0.88995
35	Burdur	-0.08889	76	Gümüşhane	-0.90573
36	Niğde	-0.09432	77	Rize	-0.9106
37	Bingöl	-0.13473	78	Bayburt	-0.9192
38	Mardin	-0.15254	79	Şırnak	-0.93726
39	Kırklareli	-0.15274	80	Düzce	-0.98155
40	Hatay	-0.19272	81	Bolu	-1.03815
41	Adıyaman	-0.23841			

Table 5. Ordering the provinces in Turkey according to the second factor scores

Number	Provinces	Factor Scores	Number	Provinces	Factor Scores
1	Samsun	5.61294	42	Elazığ	-0.34577
2	Diyarbakır	3.24624	43	Bayburt	-0.39136
3	İstanbul	2.60951	44	Trabzon	-0.39216
4	Tokat	2.28391	45	Siirt	-0.39569
5	Muş	1.92653	46	Bingöl	-0.41633
6	Balıkesir	1.44156	47	Kırıkkale	-0.41789
7	Bitlis	1.14174	48	Gümüşhane	-0.42124
8	Afyon	1.10416	49	Isparta	-0.42607
9	Kayseri	1.05375	50	Nevşehir	-0.43665
10	Amasya	0.95361	51	Kahramanmaraş	-0.438
11	Sivas	0.759	52	Malatya	-0.43874
12	Düzce	0.57532	53	Konya	-0.45402
13	Giresun	0.48221	54	Niğde	-0.45414
14	Çorum	0.46047	55	Osmaniye	-0.45729
15	Kütahya	0.43494	56	Ağrı	-0.45956
16	Yozgat	0.40226	57	Uşak	-0.46919
17	Kastamonu	0.19078	58	Yalova	-0.47003
18	Bartın	0.18312	59	Batman	-0.47006
19	Kırklareli	0.16848	60	Rize	-0.48456
20	Bolu	0.0716	61	Eskişehir	-0.4878
21	Kocaeli	0.05937	62	Artvin	-0.49195
22	Çankırı	0.03702	63	Hakkari	-0.49504
23	Erzincan	0.00476	64	Mardin	-0.49771
24	Sinop	0.00429	65	Bilecik	-0.50328
25	Sakarya	-0.06269	66	Karaman	-0.52529
26	Ordu	-0.06519	67	Adıyaman	-0.54026
27	Aydın	-0.15271	68	Denizli	-0.54658
28	Karabük	-0.15512	69	Kilis	-0.58321
29	Ankara	-0.15632	70	Burdur	-0.59445
30	Tekirdağ	-0.16386	71	Adana	-0.59468
31	Erzurum	-0.17043	72	Tunceli	-0.60358
32	Şırnak	-0.18762	73	Gaziantep	-0.60362
33	Zonguldak	-0.19218	74	Antalya	-0.63183
34	Iğdır	-0.19334	75	Manisa	-0.6441
35	Bursa	-0.19866	76	Ardahan	-0.73602
36	Aksaray	-0.20638	77	Kars	-0.74065
37	Edirne	-0.23712	78	İzmir	-0.75249
38	Hatay	-0.2661	79	Mersin	-0.89947
39	Çanakkale	-0.2961	80	Van	-1.01363
40	Muğla	-0.31938	81	Şanlıurfa	-1.12237
41	Kırşehir	-0.33763			

Table 6. Ordering the provinces in Turkey according to the third factor scores

Number	Provinces	Factor Scores	Number	Provinces	Factor Scores
1	Manisa	4.91982	42	Nevşehir	-0.28364
2	Bolu	3.69417	43	Bilecik	-0.28989
3	Balıkesir	3.61973	44	Kırşehir	-0.29076
4	İzmir	2.80113	45	Trabzon	-0.29534
5	Sakarya	2.33917	46	Kilis	-0.30739
6	Konya	0.97254	47	Amasya	-0.31064
7	Bursa	0.81619	48	Kırıkkale	-0.31085
8	Kocaeli	0.7158	49	Malatya	-0.31621
9	Ankara	0.63988	50	Osmaniye	-0.32773
10	Afyon	0.57808	51	Hatay	-0.344
11	Mersin	0.45166	52	Muğla	-0.35498
12	Uşak	0.14982	53	Karaman	-0.36999
13	Çanakkale	0.12905	54	Artvin	-0.37882
14	Şanlıurfa	0.11264	55	Karabük	-0.3792
15	Eskişehir	0.0938	56	Aydın	-0.38034
16	Düzce	0.09181	57	Erzincan	-0.38404
17	Burdur	0.02063	58	Yalova	-0.38726
18	Tekirdağ	0.01079	59	Rize	-0.38871
19	Antalya	0.00312	60	Bayburt	-0.39548
20	İstanbul	-0.00525	61	Bartın	-0.39668
21	Çorum	-0.02521	62	Iğdır	-0.40201
22	Kayseri	-0.0402	63	Kahramanmaraş	-0.4164
23	Denizli	-0.04251	64	Tunceli	-0.43175
24	Ağrı	-0.0432	65	Gümüşhane	-0.434
25	Adana	-0.06888	66	Kütahya	-0.44221
26	Zonguldak	-0.07265	67	Sinop	-0.46708
27	Batman	-0.08738	68	Giresun	-0.49586
28	Elazığ	-0.0912	69	Ordu	-0.50091
29	Edirne	-0.10264	70	Bitlis	-0.51488
30	Sivas	-0.12419	71	Hakkari	-0.52807
31	Kırklareli	-0.13323	72	Mardin	-0.53255
32	Muş	-0.15001	73	Kastamonu	-0.54374
33	Gaziantep	-0.15544	74	Tokat	-0.55441
34	Isparta	-0.17912	75	Samsun	-0.56149
35	Yozgat	-0.18365	76	Van	-0.58192
36	Niğde	-0.18425	77	Adıyaman	-0.6148
37	Aksaray	-0.18878	78	Şırnak	-0.78763
38	Diyarbakır	-0.19801	79	Siirt	-0.84437
39	Erzurum	-0.20183	80	Ardahan	-1.11451
40	Çankırı	-0.20771	81	Kars	-1.75285
41	Bingöl	-0.26111			

Table 7. Ordering the provinces in Turkey according to the fourth factor scores

Number	Provinces	Factor Scores	Number	Provinces	Factor Scores
1	Siirt	3.07262	42	Ordu	-0.2513
2	Mardin	2.50174	43	Çorum	-0.27649
3	Mersin	2.49682	44	Erzurum	-0.29591
4	Antalya	2.37236	45	Uşak	-0.31737
5	Şırnak	2.34331	46	Iğdır	-0.32258
6	Van	2.04381	47	Bursa	-0.32665
7	Diyarbakır	1.75341	48	Afyon	-0.33503
8	Konya	1.65568	49	Kayseri	-0.3577
9	Muğla	1.25212	50	Kırklareli	-0.44208
10	Adana	1.21166	51	Kilis	-0.4539
11	Kahramanmaraş	1.20525	52	Sivas	-0.47778
12	Bitlis	1.00625	53	Osmaniye	-0.4959
13	Samsun	0.75428	54	Kırşehir	-0.51455
14	Hakkari	0.73547	55	Yozgat	-0.54514
15	Aydın	0.71338	56	Aksaray	-0.54999
16	Şanlıurfa	0.6476	57	Amasya	-0.55098
17	Kütahya	0.60815	58	Erzincan	-0.57056
18	Kastamonu	0.52801	59	Çankırı	-0.65769
19	Adıyaman	0.39783	60	Bartın	-0.7199
20	Çanakkale	0.36526	61	Edirne	-0.72272
21	İzmir	0.33647	62	Bilecik	-0.72602
22	Manisa	0.33439	63	Tekirdağ	-0.73002
23	Karaman	0.30219	64	Giresun	-0.76506
24	Balıkesir	0.29451	65	Karabük	-0.78244
25	Bingöl	0.28925	66	Zonguldak	-0.79758
26	Isparta	0.28482	67	Gümüşhane	-0.83122
27	Denizli	0.23481	68	Kırıkkale	-0.84613
28	Ağrı	0.22741	69	Artvin	-0.87453
29	Ankara	0.22698	70	Nevşehir	-0.89969
30	Elazığ	0.19966	71	Yalova	-0.92857
31	Gaziantep	0.12456	72	Rize	-0.93282
32	Eskişehir	0.01325	73	Bayburt	-0.95416
33	Tokat	0.00151	74	Bolu	-0.96922
34	Malatya	-0.03024	75	Trabzon	-0.97337
35	Burdur	-0.04659	76	Kocaeli	-0.99929
36	Hatay	-0.08684	77	Düzce	-1.00337
37	Batman	-0.11346	78	Sakarya	-1.05143
38	Muş	-0.207	79	İstanbul	-1.09644
39	Niğde	-0.2126	80	Ardahan	-1.86493
40	Tunceli	-0.22803	81	Kars	-2.15729
41	Sinop	-0.24226			

These provinces were followed by Ardahan, Sanliurfa, İzmir, Balıkesir, Mus, Agri and Van, and accordingly they have fallen among the top 10 best provinces. A total of 6 provinces from Eastern Anatolia region have fallen among the top 10 best provinces. It can be said that Eastern Anatolia region have more developed than other regions in respect to this kind of animals. Duzce and Bolu provinces have fallen within last orders with,-0.98155 and-1.03815 factor scores (Table 4).

The scores of second factor (adult buffalo, buffalo and duck) are given in Table5. According to these scores, Samsun has fallen within 1 st order with 5.61294 factor score, Diyarbakir, 2nd order with 3.24624 factor score, Istanbul, 3th order with 2.60951 factor score. Tokat, Mus, Balıkesir, Bitlis, Afyon, Kayseri and Amasya provinces followedthese provinces and accordingly they have fallen among the top 10 most developed provinces.Van and Sanliurfa provinceshave fallen within last orders with,-1.01363 and-1.12237 factor scores. According to thethird factor scores given in Table6 (chicken and turkey), Manisa, Bolu and Balıkesir provinceshave been placed near the top with factor scores respectively 4.91982, 3.69417 and 3.61973. In other words,poultryraising has been mostly performed in these 3 provinces. İzmir,Sakarya, Konya, Bursa, Kocaeli, Ankara and Afyon provinceshave taken part among the top 10 best provinces together with these provinces. Siirt, Ardahan and Kars provinceshas fallen within last orders wither spectively -0.84437, -1.11451 and -1.75285 factor scores.

According to the the fourth factor scores given in Table7 (goat and mule), Siirt, Mardin and Mersin provinces have been placed near the top with factor scores respectively 3.07262, 2.50174 and 2.49682factor scores. Antalya, Sirnak, Van, Diyarbakir, Konya, Mugla and Adanaprovinces followed these provinces and accordingly they have placed among the top 10 most developed provinces. Istanbul, Ardahan and Kars provinces has fallen within last orders with respectively -1.09644, -1.86493 and -2.15729 factor scores.

Regarding factor analysis, (Unsal, 2004),in his study in relation to "factor analysis for regional development",he identified 4 factors as health and welfare, child health and agriculture, education and teaching and income and energy factors. It was determined that number of developing provinces in respect to health and welfare factor and income and energy factor was more than number of developed provinces.

CONCLUSION

It was intented to make a ranking interprovinces discussing numbers of animals according to their types in Turkey.In the study of 13 variable used,4 important factors were identified by factor analysis.In the ranking performed according to the first factor including adult cattle, cattle, horse, goose, donkey and sheep, Kars, Erzurum and Konya provinces fallen within first 3 orders. Samsun, Diyarbakir and Istanbul provinces are among the best provinces according to the buffalo and duck factor. Manisa, Bolu and Balıkesir are amongthe best provinces according to the poultry factor. Siirt, Mardin and Mersin provinces are among the best provinces according to the goat and mule factor.

Regarding animal breeding,the most suitable places in respect to animal breeding should be investigated, an increase in number of animals and livestock products and accordingly income should be provided.When these targets realised, husbandry will provide important contributions to the economy of Turkey.The results of this study performed using advanced statistical methods will shed light to the studies that will be performed in future in terms of level of development of provinces,husbandry and other fields.

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