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Bus 273: Statistical Analysis for Business

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PROBLEM SHEET # 9

Problem 1: The weight of eggs and the hatching (*yumurtalama*) time of chicks are important issues in poultry farming.

a) The weight of eggs (measured in grams) from hens of a certain age has a normal distribution with mean 57.8 and standard deviation 3.2. Give an interval which will cover the weight of about 95% of these eggs.

b) What share of eggs will be expected to have a weight above 60 grams?

c) In a sample of 100 eggs, the first chicks hatched after an incubation (*kuluçka*) time of 450 hours, the last after 504 hours. Assuming that hatching time is approximately normally distributed, determine the standard deviation and the variance of hatching time. Also mention the unit of measurement of standard deviation and variance in this case.

Problem 2: The daily milk production of Simmental cows is approximately normally distributed with a mean of 15 kg/day and a standard deviation of 7 kg/day. Assume that as a farmer, you have 150 Simmental cows.

a) Calculate the probability that a day's production for a single animal will be less than 10 kg.

b) How many of your cows can be expected to produce more than 10 kg in a given day?

c) Calculate the probability that the total amount of milk produced in a day will be more than 2300 kg.

d) What is the probability that the average daily milk amount per cow in a given day is more than 15 kg?

e) Assume that you are the supplier for Pınar Süt Corporation. You have guaranteed that you will provide at least 2000 kg milk per day to Pınar. If you are short of that amount, you will be fined 1000 TL. What is the expected value of your fine per day?