Let's analyze each interpretation based on the principles of statistics and confidence intervals:

\*\*28. We are 95% confident that the true average number of chocolate chips per cookie is between 18.6 and 21.3.\*\*

- \*\*Analysis\*\*: This interpretation is correct because it properly states the confidence level (95%) and describes the interval as containing the true population mean with that level of confidence. This is the standard interpretation of a confidence interval.

- \*\*Answer\*\*: (A) Valid

\*\*29. 95% of the cookies in the population have between 18.6 and 21.3 chocolate chips.\*\*

- \*\*Analysis\*\*: This interpretation is incorrect because a confidence interval describes the range in which we expect the population mean to lie, not the range within which individual cookies' chip counts will fall. The interval is about the average, not about the distribution of individual cookies.

- \*\*Answer\*\*: (B) Invalid

\*\*30. If we took many samples and constructed a 95% confidence interval from each, about 95% of these intervals would contain the true average number of chocolate chips per cookie.\*\*

- \*\*Analysis\*\*: This interpretation correctly reflects the definition of a confidence interval in the long run. Over repeated sampling, approximately 95% of the constructed intervals would capture the true population mean.

- \*\*Answer\*\*: (A) Valid

\*\*31. There is a 95% probability that the true average number of chocolate chips per cookie is between 18.6 and 21.3.\*\*

- \*\*Analysis\*\*: This statement is subtly incorrect in the context of frequentist statistics, where once the interval is calculated, the true mean is either within it or not, with no probability involved. The 95% refers to the method's reliability over many repetitions, not to the probability of the true mean being in this specific interval.

- \*\*Answer\*\*: (B) Invalid

So, based on the analysis:

- \*\*28\*\*: (A) Valid

- \*\*29\*\*: (B) Invalid

- \*\*30\*\*: (A) Valid

- \*\*31\*\*: (B) Invalid