*Chapter Eight notes* ***for Agri-food research***

Summary from page 228

*The theory of probability provides a formal language and mathematics for dealing with chance phenomena.*

[TBC]

But why the reluctance to use this brilliant theory developed over the last 350 years? I am often asked why people tend to find probability a difficult and unintuitive idea, and I reply that, after forty years researching and teaching in this area, I have finally concluded that it is because probability really is a difficult and unintuitive idea. I have sympathy for anyone who finds probability tricky. Even after my decades as a statistician, when asked a basic school question using probability, I have to go away, sit in silence with a pen and paper, try it a few different ways, and finally announce what I hope is the correct answer.

*The implications of probability are not intuitive, but insights can be improved by using the idea of expected frequencies.*

[TBC]

Interpretations of probability vary.

**Classical** – “two sides of a coin” so the probability of each side coming up in a fair toss is ½ …

**Long run frequency** -

We now come to the crucial but difficult stage of laying out the general connection between probability theory, data and learning about whatever target population we are interested in.

*The ideas of probability are useful even when there is no explicit use of a randomizing mechanism.*

But in practice we may be faced with situation 2: When a pre-existing data-point is chosen by a randomizing device, say when selecting people to take part in a survey. And much of the time our data arises from situation 3: When there is no randomness at all, but we act as if the data-point were in fact generated by some random process, for example in interpreting the birth weight of our friend’s baby.

If We Observe Everything, Where Does Probability Come In?

[TBC]

*Many social phenomena show a remarkable regularity in their overall pattern, while individual events are entirely unpredictable.*

[TBC]