What is the relationship between the circumference of a potato and the weight of potato?

(1)

I am interested in this because when I was watching the news this year there was an article on the price of potatoes increasing due to the amount of rain that had fallen and causing the potato to get a blight and rot. We eat a lot of potatoes in our house and if there is a blight it might mean we have to do without potatoes or pay more money for them.

For this experiment I am going to select my potato's from a10kg bag of new season potatoes which are unwashed, and the variety of potato called "white potatoes" because their skin is white hence the name.

To carry out the practical side of this experiment we have been given two periods of 1 hour one after the other. I will first wash the potato to remove all the dirt from skin and pat them dry with a handy towel and then leave them to dry for another 20 minutes. This hopefully will ensure that I am only going to weigh the potato without the additional weight of dirt or added water and measure then potato without additional dirt. When I measure the circumference of the potato, I am going to measure it from the eye end to the other end, so I am measuring the longest circumference of the potato. I decide to measure the potato's this way as when a potato grows it grows like a vine like structure under the ground attached to the seed potato so when it dug up the potato has some deformities. These can be referred to the eyes of the potato hence if all measurements are taken from end to end. I will place the potato against the surface of the table. I will use a piece of string to measure the circumference of the potato from end to end. I will do this because potatoes are not flat or straight, they are curved so using a piece of string should produce more accurate result. I will place a piece of string around the potato from one end to the other making sure I pull it tight but not tight that the string cuts into the potato. I will then transfer the length of string onto the 1-meter ruler.

(3)

(2)

When using the piece of string to measure the circumference I will tie a knot at one end and use this end as the starting point for my measurement. The other end of the string I will hold with my thumb nail and then transfer the length onto the ruler. I will then place the potato onto the scales to get the weight. I will ensure that each time I take the weight I will reset the scales back to zero. As potatoes come in different shapes and sizes, I will select random potatoes from a 10 kg bag. This should give a good representation. Any sooky or rotten looking potatoes we will not measure, and we will select another potato from the bag. The number of potatoes is 20.

(3)

Count	Circumference of potato (cm)	Weight of potato (g)	Count	Circumference of potato (cm)	Weight of potato (g)
1	32.4	92.42	11	40.9	123.30
2	38.8	96.70	12	35.7	75.74
3	30.7	70.12	13	33.2	93.88
4	25.6	81.20	14	55.8	94.94
5	37.5	61.84	15	48.2	110.92
6	29.5	93.26	16	44.9	88.06
7	22.9	103.70	17	56.3	109.24
8	31.7	86.50	18	49.7	117.72
9	35.4	117.02	19	46.5	126.18
10	36.1	73.38	20	35.3	137.44

(4)

Circumference versus Weight of Potatoes
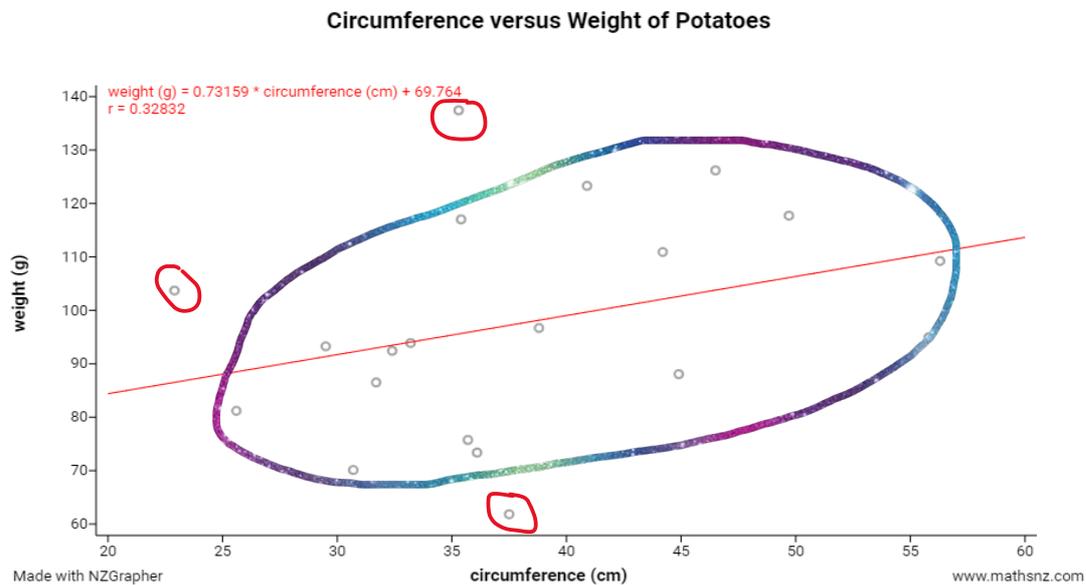
The graph shows that if the circumference of the potato increases then the weight of the potato tends to increase also. I kind of expected this because if a potato has a larger weight then the potato is usually wider and bigger and hence a larger circumference. This has been shown in my graph because the trend line shows a positive relationship sloping upwards. Some points are relatively close or on the line of best fit, for example, data point 1 the circumference of the potato is 32.4 cm and the weight is 92.42grams, data point 13 has a circumference of 33.2 cm and a weight of 93.88grams, data point 6 has a circumference of 29.5cm and a weight of 93.26grams and data point 17 has a circumference of 55.3 cm and a weight of 109.24grams. There are points which are some way from the line of best fit, for example, data point 9 has a circumference of 35.4cm and a weight of 117.02 grams and data point 19 has a circumference of 46.5 cm and a weight of 126.18 grams, data point 10 has a circumference of 36.10cm and a weight of 73.38 grams however they still form a cluster in an upward slope. There is also three data points which is separate from the rest of the data these points is data are point 5 which has a circumference of 37.5 cm and a weight of 61.84grams, data point 20 has a circumference of 35.3 cm and a weight of 137.44 grams and data point 7 has a circumference of 22.9cm and a weight of 103.70grams. I can only say there given the wide scatter that there is only a weak relationship between the circumference of the potato and weight of the potato.

So, I think the relationship is a weak one. If I were to repeat this experiment again, I would make sure I measured the potato three times and average out the circumference measurement, by doing this I would be trying to minimize and measurement error of the circumference. I would also ensure that each potato when washed was dried property because as the time for collecting this data was only 2 hours the resting time for the potatoes after they were washed and dried was not the same and some of the potatoes were just washed, measured and weighed. Also depending on how much dirt there was on the potato influenced how much washing it required so some potatoes were scrubbed very hard potentially reducing the volume of the potato but increasing the amount of water used and maybe absorbed by the potato so overall increasing the weight whereas others only needed a light wash. I think these issues contributed to some of the very high weights for the circumference.