ANALYSIS OF BEEF INVENTORY PLANNING WITH APPROACH MONTE CARLO METHOD IN CV. PUTRA SURYA

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ABSTRACT

Research with the title Analysis of Planning Beef Inventory with Monte Carlo Method Approach in CV. Putra Surya was held for 3 months, from September to November 2019.The data used in this research is secondarydata obtained from the owner of CV. Putra Surya. Based on the results of the analysis that has been done with Monte Carlo Simulation, CV. Putra Surya can plan beef supply for 2020 of 35,388 kg of beef with an average demand in one week of 707.76 kg. For expected requests or expected values of 704.96. The average demand that has been processed by the Monte Carlo Simulation method of 707.76 kg per week is not too different from the expected demand of 704.96 kg per week. There is a difference of 2.8 kg between the simulation value and the expected value and this difference can be influenced by the number of tests or experiments conducted.

Keywords: Inventory,Supplay,Demand,MonteCarlo

INTRODUCTION

Humans have a variety of needs ranging from needs at the primary, secondary and tertiary level. In general, humans have the same basic needs, namely the need for sleep, drink, eat and so forth. Talking about needs, of course humans mustmeetbasicneedsinordertobeableto live life, logically if humans do not drink and eat then they can get sick and eventually they can die. The human body needs a variety of substances for the survival of its metabolic system, these substances include carbohydrates, fats, vitamins, calcium, folic acid, iron, omega3, fiber and protein of course. Protein is divided into 2, which are sourced from animals and plants.

Fulfillment of animal protein can be fulfilled by consuming meat, in general Indonesian people are very familiar andlike to consume beef. We find a variety of processed beef in a variety of culinary delights in this beloved country so it's no wonder the increasing demand for beef will provide promising business opportunities for both cattle ranchers, beef traders ormeat sellers. On November 30, 2019, the price of beef in Jember Regency was Rp. 110,000. Basically the price of meat will fluctuate according to market conditions, the increasing demand will usuallyincrease thesellingpriceof themeatandthiswillbe felt in the end consumer in general, the increase in beef prices usually at certain moments such as on the Eidal-Fitr, the

feast Eid al-Adha and Christmas and the new year. At that moment, the demand for meat will significantly increase especially when facing the Eid and Eid al-Adha holidays. The breeders we visited during this research also stated that in those days the demand for beef was indeed very high, as evidenced in the last few years, the breeders we visited stated that they were completely out of stock.

Jember as a city that is famous for its very advanced and developing karnvalnya in various sectors ranging from the trade sector is evidenced by the development of various large supermarkets such as Lippo, the education sector is evidenced by the many public and private universities and other sectors which this certainly makes Jember as a destination city foremployment and take education so that it is certain that the population in the city of Jember will increase and this is evidenced by the large number of new housing estates built where the average population is from outside the city of Jember. Increasingly dense population in a city there are of coursenegativeandpositiveimpactsand

when talking about positive impacts actuallythisisagoldenopportunityfor businesspeopleincludingbusinessactors

inthefieldofbeefsupply,themarketisan opportunitythishasbeenproventhatthe numberofnewhousinginthedistrict

Jemberhascreatednewjobopportunities forpeoplewhowereinitiallyunemployed, oneofwhichisthatmanypeopleinJember

workasvegetabletraderstomeettheneeds ofvegetablesandmeatincludingbeefthat isneededbythecommunity,especially

housingcommunitieswhoaresuperbusy anddonothavemuchtimetoshopto marketsandsupermarketssuchasthe

GoldenMarket.

calledCV.PutraSurya,thisCVislocated onlotusroadnumber12KaliwatesJember.

crackers,buildingmaterialtransportation servicesandcattletrade.IntheCVPutra

Surya cattle trade business it is more for cattle fattening, then the cattle will be sold to beef slaughterers and then sold meat in other words this CV deliberately provides beef cattle to meet the demand for beef from beef slaughterers or the term inJember is the name cow slaughterhouse. This CV, founded by Mr. Farid Wahyudi, was established in early 2000 and still survives and develops until now.

The location of the cattle feedlot is in the Wuluhan sub-district of Jember district and based on research in the field of the cow fattening business owned by CV Putra Surya, it serves the demand of several butchers or cattle slaughtering business owners to further sell the meat to the end consumers. Consumers of CV Putra Surya are mostly in the southern Jember region and some are located in Jember City or downtown Jember. Based on data provided by the owner of CV Putra Surya, the following can be presented related to beef demand on a weekly basis.

Table1.BeefDemandforCVPutraSuryain Weekly2019

Week	RequestInKg
1	660
2	620
3	564
4	680
5	680
6	600
7	608
8	612
9	652
10	650
11	645
12	580
13	625
14	600
15	575
16	575
17	585
18	592
19	625
20	680
21	2000
22	900
23	854
24	700
25	655
26	578
27	600
28	675
29	825

Week	RequestInKg
30	1500
31	775
32	745
33	550
34	550
35	572
36	565
37	670
38	525
39	525
40	586
41	600
42	1150
43	800
44	640
45	600
46	625
47	700
48	925
49	800
50	650
Total	**35248**

Source:SecondaryDataCVPutraSurya2019

Based on table 1 above we can see together in certain months there is an increase in demand for beef from cattle butchers or butchers. In June 2019 to coincide with Idul Fitri, the demand for meat to CV Putra Surya increased to 2000 kg or 2 tons. Continued in August 2019 the demand for beef in the amount of 1500 kg or 1.5 tons a monthcoincides with the feast of Eid al-Adha. November 2019 coincides with the Birthday of the Prophet Muhammad SAW also an increase in demand of 1150 kg and the last in December 2019 on Christmas also an increasein demandforbeefasmuchas925 kg.

CV Putra Surya itself in the year2019 provides a price range of Rp. 90,000 to Rp. 100,000 per kg for butchers or beef slaughterers so that between this CV and slaughterers mutualism symbiosis occurs, basically the slaughterers have a chance to get a sizable profit because the standard retail price of beef at the final consumer level in 2019 ranges from Rp.110,000 to Rp..115,000.Butchersorbeefslaughterers also have a good understanding of the physical nature of cows sold by CV Surya Putra in the sense of how many cows will come out after slaughtering, based on the data in the field, there is very little

difference between the clean meat provisions estimated by CV Putra Surya to simplify it can be explained in thefollowingconciselanguage.Forexample,1 cow has been estimated by CV PuteraSurya to produce 170 kg of meat, thenwhen slaughtered and slaughtered by slaughterers, meat will get in the range of 170kgto185 kg,itrarelyhappens afterthe cows have produced meat in the range below 170 kg if This CV already mentions 170 Kg.

Based on table 1 above actually there is something that can be studied so as to produce a benefit in the form of convenience, especially for owners of CV Putra Surya related to inventory. However in the case of supply based on 2019 meat demand data there are certain monthswhose demand for meat has increased dramatically compared to previous months or weeks. We all know that the stock of merchandise is important for the sustainability and development of a business or business, too much inventory will actually cause costs such as maintenance costs and so forth, especiallyif the inventory is in the form of maintaining living things in the form of cows, it is clear that the supply excess will only cause swelling in feed and maintenance costs so that the expected cost efficiency will not be achieved. If the supply is too little and cannot meet the demand from consumers, this will also cause many problems, including switching to consumers and other providers.Basically, the inventory must be balancedin the sense that it is not excessive but can still cover or meet the demand from consumers.

Approach using the monte carlo method would be needed in predicting the inventory that must be prepared in the following years by CV Putra Surya, of course, referring to demand data that had occurred in previous years. Later it is expectedthatwith theright prediction there will be no excess inventory and shortages

as stated by the CV owner who has experienced this.

Inventories according to Mulya(2010:2014)areactivitiesintheproduction process, in travel, raw materials and equipment used in the production processor service delivery. Talking about theactual scope of the inventory is broad, but its implementation in the field of inventory is considered more on the availability of merchandise that will be purchased by consumers and utilized by them. If we associate it with inventory on CV Putra Surya, it will be easier to obtain inventory in the form of the presence of cows which will be sold to cattle slaughterers or better known as slaughterers in Jember district. Assauri (2016: 225-227) Inventory (inventory) is the stock of an item or resource used in a company organization. The words stock are also better understood bythe public merchandise savings, actually the availability of sufficient stock and can meet the needs of customers or consumers is a matter that must be prioritized because afterallasabusinessactoractuallythelack of stock must be avoided because we can make customers move to other providers or traders to meet their needs. In general, the supply must be measured in terms of inventory must be able to meet the demand of every consumer, but the inventoryshould not be excessive in the sense of too long in the warehouse, in the store, causing new problems such as problems with expired or increased maintenance costs and so forth. Measured or well planned and predicted inventory in exact numbers will supporttheprogressofabusinessincluding the business carried out byCV PutraSurya.

Forecasting is a process forestimating how many needs in the future include needs in terms of quantity, quality, time and location needed in order to meet the demand for goods or services(Nasution, 2006). From this understanding predicting activities are highly recommended especially in business activitiesbutpredictingdoesnotmean carelessly because in forecasting methodsor other languages is forecasting that requires preliminary data to be analyzed so that we can predict related demand forecasting next year for example, the quantity must be produced, the quality that consumers want, the right location, theright time and so forth. According to Assauri (2016: 72), defining forecasting is the activity of predicting future values, on the basis of knowledge or values prepared in the past. Predictions that have been prepared may not necessarily be exactly as planned but with predictions that have been made based on past data and past experience that has been passed, it is expectedthatapredictionwillapproach the level of truth and accuracy as predicted. Basically with forecasting we will have a picture and with a picture that is already in the minds of the decision makers, it is expected that each step and decision taken will minimize the risk and support the progress of a business especially those related to the business of living things carried out by CV Putra Surya.

Monte Carlo Simulation Method according to Muslich (2009: 410) is a method used to produce an outcome from a probability distribution. The random process in Monte Carlo uses random numbers. This random number is a set of numbers that the likelihood of occurring is the same (the probability of occurrence of the number is the same) and the pattern of numbersthatarisecannotbeidentified.The random numbers used in Monte Carlo simulations are computer generated and are commonly called pseudo random numbers. Monte Carlo simulation can be defined as a real system simulation which in nature is a unit / particle, by observing the behavior of a number of units / particles that have conditions randomly according to population distribution, similar to real systemsthroughrandomnumbergeneration (Sediawan, 2013: 3). Observation of this behavior can be viewed from the demand side also where in the CV. Putra Surya related to beef demand also fluctuates

especially in certain months in which there are holidays and so forth so that by understanding the inventory, forecasting and monte carlo simulation methods can later be obtained a quick count method in determiningthe inventoryitselfpreciselyin the CV Putra Surya in Jember.

Previous research conducted by Dedrizaldi (2019) found that by applying monte carlo simulations to PT. Agrimitra Utama Persada, the planning of mineral water supply is more appropriate in termsof mineral water supply as a result of the company's production is always in a safe condition and not excessive so that the expected cost efficiency can be achieved. Bambang (2007) in his research by using monte carlo simulation method, thefindings of supply and demandmanagement can be measured or estimated to produce accuracy or close to the same relatedtotheamountofsupplyanddemand from consumers. Irfan (2019) found that monte carlo simulation could be implemented in the inventory of processed products that collided with expiration, with the simulation also found that the FIFO concept could be carried out on the inventory of processed products. In Kiki's research (2019) concluded that monte carlo simulation can provide benefits related to the determination of the amount of inventory needed in the future.

RESEARCHMETHODS

This research was conducted at CV. Putra Surya address at Jl. Lotus No. 12 Kaliwates Jember, all secondary data obtained at the address of the researchers,as for the field visit related to the cattle fattening business conducted by CV Putra Surya,afieldvisitwasconductedin3 cattle fattening sites, all of which were located in Wuluhan sub-district, Jember district.

The time of the study was carried out for3months,fromSeptembertoNovember 2019. The research began with a field visit to the location of a cattle farm owned by CV. Putra Surya, the next is a visit to the CV location to get the secondary data that we need, checking the secondary data with the original situation in the field we do in order to produce findings that are appropriate and useful for this CV and scientific development.

The data used in this research is secondarydata,thedatais obtaineddirectly from the owner of CV. Putra Surya, Mr. Farid Wahyudi. Softcopy of the data obtained in the form of quantitative data in the form of numbers related to the number of beef requests from butchers or beef slaughterers who have become consumers or regular customers of CV. This SuryaSon.

Theoveralldatasourceobtainedfrom the owner of this CV, quantitative data directlyprovidedbythe owneroftheCVin the form of softcopy files while the qualitative data researchers get from observations or direct observations at the business location.

RESULTANALYSIS

The Monte Carlo simulation method is a probabilistic simulation with the aim of finding problems with sampling from a random or random process. Experiments or experiments conducted in this method on probabilistic elements through random sampling. The following to clarifyit can be seen in table 2 below.

Table2DataProcessingandMonteCarloSimulationResults

No.	Permin taanPer minggu	Fre kuensi	Proba bilitas	Kumulatif Proba bilitas	Interval Bilangan Acak	Bila ngan Acak	Hasil Simu lasi
1	660	1	0,02	0,02	00-02	16	612
2	620	1	0,02	0,04	03-04	77	525
3	564	1	0,02	0,06	05-06	81	600
4	680	1	0,02	0,08	07-08	41	2000

No.	Permin taan Per minggu	Fre kuensi	Proba bilitas	Kumulatif Proba bilitas	Interval Bilangan Acak	Bila ngan Acak	Hasil Simu lasi
5	680	1	0,02	0,10	09-10	73	670
6	600	1	0,02	0,12	11-12	44	900
7	608	1	0,02	0,14	13-14	28	600
8	612	1	0,02	0,16	15-16	17	652
9	652	1	0,02	0,18	17-18	36	592
10	650	1	0,02	0,20	19-20	83	1150
11	645	1	0,02	0,22	21-22	39	680
12	580	1	0,02	0,24	23-24	17	652
13	625	1	0,02	0,26	25-26	71	565
14	600	1	0,02	0,28	27-28	64	745
15	575	1	0,02	0,30	29-30	47	700
16	575	1	0,02	0,32	31-31	67	550
17	585	1	0,02	0,34	33-34	88	640
18	592	1	0,02	0,36	35-36	25	625
19	625	1	0,02	0,38	37-38	20	650
20	680	1	0,02	0,40	39-40	20	650
21	2000	1	0,02	0,42	41-42	74	670
22	900	1	0,02	0,44	43-44	73	670
23	854	1	0,02	0,46	45-46	50	655
24	700	1	0,02	0,48	47-48	90	600
25	655	1	0,02	0,50	49-50	50	655
26	578	1	0,02	0,52	51-52	71	565
27	600	1	0,02	0,54	53-54	18	652
28	675	1	0,02	0,56	55-56	41	2000
29	825	1	0,02	0,58	57-58	15	652
30	1500	1	0,02	0,60	59-60	89	600
31	775	1	0,02	0,62	61-62	68	550
32	745	1	0,02	0,64	63-64	67	550
33	550	1	0,02	0,66	65-66	39	680
34	550	1	0,02	0,68	67-68	43	900
35	572	1	0,02	0,70	69-70	7	680
36	565	1	0,02	0,72	71-72	24	580
37	670	1	0,02	0,74	73-74	75	525
38	525	1	0,02	0,76	75-76	68	550
39	525	1	0,02	0,78	77-78	76	525
40	586	1	0,02	0,80	79-80	9	680
41	600	1	0,02	0,82	81-82	46	854
42	1150	1	0,02	0,84	83-84	38	625
43	800	1	0,02	0,86	85-86	39	680
44	640	1	0,02	0,88	87-88	38	625
45	600	1	0,02	0,90	89-90	71	565
46	625	1	0,02	0,92	91-92	78	525
47	700	1	0,02	0,94	93-94	97	800
48	925	1	0,02	0,96	95-96	3	620
49	800	1	0,02	0,98	97-98	18	652
50	650	1	0,02	1,00	99-100	63	745
	Total	50	1				35388

SourceDataProcessed:2019

The following is a description of how to determine the frequency, determine the probability, cumulativeprobability, random number intervals, random numbers and the last is the result of the simulation.

Determine the frequency, based ontheabove tableit is clear thatthe frequency value is 1 where in the first week there is demand for beef in the amount of 660 kg, the frequencyvalue in the second week is 1 where there is demand for beef in the week amounting to 620 kg, this frequency value remains 1 to 50 weeks according to the table above.

Determining the probability is to divide the frequency value by the total frequency value in its implementation in this research means 1 divided by 50 so that it produces a probability value of 0.02.

Cumulativeprobabilityisobtainedby adding a probability value of week 0 to week 1 resulting in 0.02 then probability week1isaddedtoprobabilityweek2 resultinginacumulativeprobabilityvalue of0.04andsoonuntilweek50and yielding cumulative probability 1.

The random number interval is determined by taking into account the probabilities of the table above. Therandom number interval is determined by considering the probability, with a probability of 0.02 meaning there is a probability of 2%. If in this simulation 2-digit random numbers are used totaling100 random numbers then given to the first 2 random numbers (01-02) and the last is the interval (99-100).

Determine random numbers can use the help of software in the form of Microsoft Excel by typing = Randbetween (1; 100) after that press enter and copy the formula = Randbetween (1; 100) until the 50th week then every week a number will appear. which is automatically randomized by exel. In this research random numbers 16;77;81;41;73;44;28;17;36;83;39; 17;71;64; 47 ;;6788;25;20;20; 74; 735; 0;90;50;71;18;41;15;89;68;67;39;; 437;24;75;68;76;9;46;38;;3938;71; 78; 97; 3; 18; 63.

The simulation results are by determiningtheKgvalueofthedemandfor meat every week by referring to the valueof random numbers, for example, on week one a random number is 16 and number 16 entersarandomnumberinterval15-16with a request value of 612, the simulation resultsonweekthefirstis612kgandsoon until week 50.

The next step is to determine the expectedrequestorsettheexpectedvalue. To determine the expected value, this can bedonebymultiplyingtheprobability value by the demand per week, and the details in table 3 can be seen. Before we proceed to table 3 we need to convey that the probability value we give the symbol

(p) and the request value per week we give the symbol (dm).

Table3:ExpectationsofBeefDemandfor CV Putra Surya

No	Probability	Demand/ Week(dm)	(pxdm)
1	0,02	660	13,2
2	0,02	620	12,4
3	0,02	564	11,28
4	0,02	680	13,6
5	0,02	680	13,6
6	0,02	600	12
7	0,02	608	12,16
8	0,02	612	12,24
9	0,02	652	13,04
10	0,02	650	13
11	0,02	645	12,9
12	0,02	580	11,6
13	0,02	625	12,5
14	0,02	600	12
15	0,02	575	11,5
16	0,02	575	11,5
17	0,02	585	11,7
18	0,02	592	11,84
19	0,02	625	12,5
20	0,02	680	13,6
21	0,02	2000	40
22	0,02	900	18
23	0,02	854	17,08
24	0,02	700	14
25	0,02	655	13,1
26	0,02	578	11,56
27	0,02	600	12
28	0,02	675	13,5
29	0,02	825	16,5
30	0,02	1500	30
31	0,02	775	15,5
32	0,02	745	14,9
33	0,02	550	11
34	0,02	550	11
35	0,02	572	11,44
36	0,02	565	11,3
37	0,02	670	13,4
38	0,02	525	10,5
39	0,02	525	10,5
40	0,02	586	11,72
41	0,02	600	12
42	0,02	1150	23
43	0,02	800	16
44	0,02	640	12,8
45	0,02	600	12
46	0,02	625	12,5
47	0,02	700	14
48	0,02	925	18,5
49	0,02	800	16
50	0,02	650	13
AverageRequestExpectedforOne Week			**704,96**

Source.DataProcessed :2019

INTERPRETATION

Based on the results of theanalysis that has been done with Monte Carlo

Simulation, CV. Putra Surya can plan beef supply for 2020 of 35,388 kg of beef with an average demand in one week of 707.76 kg. For expected requests or expected values of 704.96. The average demand that has been processed by the Monte Carlo Simulation method of 707.76 kg per weekis not too different from the expected demand of 704.96 kg per week. There is a difference of 2.8 kg between the simulation value and the expected value and this difference can be influenced bythe number of tests or experiments conducted.

Most important for CV. Putra Suryais preparing in advance related to the surge in demand for meat in certain months, for example on Eid al-Fitr which is sometimes still lack of meat supply and still bring in from other partners who have similar businesses. Bringing in the approachingday when the increase in demand for meat is soaring high certainly CV Putra Surya will get a high price and this is certainlyless profitable CV Putra Surya. This research provides information to CV. Putra Surya to always procure inventory more timely to avoid losses and always maintain the availability of meat supplies, but without excess in the sense that it is always enough.

The findings of previous research with this research are almost the same which essentially is to maintain the continuity of the availability of sufficient supply,butinthisresearchthereisrenewal, which is more towards the strategy of procurement of beef supplies given the cow's price also fluctuates and needs accuracy in finding prospective cows for cattle. fattened up and it takes time so the timeliness in preparing supplies is crucial, so the amount to be prepared for inventory must also be carefully calculated. With the simulationthathasbeendoneofcourseitis quite helpful regarding what should bedone by CV Putra Jaya.

CONCLUSION

Based on the results of the analysis that has been done with Monte Carlo

Simulation, CV. Putra Surya can plan beef supply for 2020 amounting to 35,388 kg. Expecteddemandorexpectedvalueof 704.96. The average demand that has been processed by the Monte Carlo Simulation method of 707.76 kg per week is not too different from the expected demand.There is a difference of 2.8 kg between the simulation value and the expected valueand this difference can be influenced bythe number of tests or experiments conducted.

IMPLICATIONS

CV. Putra Surya can use monte carlo simulation in planning beef supply in the following years. Most important for CV. Putra Surya is preparing in advance related to the surge in demand for meat in certain months, forexampleonEid al-Fitrwhich is sometimesstilllackofmeatsupplyandstill bring in from other partners who have similar businesses.

Expected CV. Putra Surya to always procure inventory more timely to avoid losses and always maintain the availability of meat supplies, but without excess in the sense that it is always enough.

REFERENCES

Assauri,Sofjan.2016. ManajemenOperasi Produksi Pencapaian Sasaran Organisasi Berkesinambungan. Jakarta: Rajawali Pers.

Bambang. 2007. Aplikasi Simulasi Untuk Peramalan Permintaan Dan Pengelolaan Persediaan Yang Bersifat Probabilistik. INASEA. Vol 8 N0 2.

Dedrizaldi. 2019. Analisis Perencanaan Persediaan Air Mineral Dengan Pendekatan Metode Monte Carlo Pada PT. Agrimitra Utama Persada. Jurnal Kajian Manajemen Dan Wirausaha. Vol 1 N0 1. ISSN2655 6499.http://siskaperbapo.com/harga/tabel/?kabkota=jemberkab(diaksesjam 17.00 tanggal30 November2019).

Irfan. 2019. Penerapan Simulasi Monte Carlo Dalam Memprediksi

Persediaan Produk Jadi Pada IKM Buluk Lupa. Jurnal Industri Pertanian.Vol1No3.ISSN2656-6569.

Kiki. 2019. Simulasi Pengadaan Barang Menggunakan Metode Monte Carlo. Jurnal Sistem Informasi Dan Teknologi.Vol1No3.ISSN2686-3154.

Mulya, Hadri. 2010. MemahamiAkuntansiDasar Edisi 2Pendekatan TeknisSiklus

Akuntansi. Jakarta: Mitra Wacana Media

Muslich, Muhammad. 2009. Metode Pengambilan Keputusan Kuantitatif. Jakarta:Bumi Aksara.

Nasution, A.H.2006. ManajemenIndustri. Yogyakarta: Andi Offset.

Sediawan, B.W. 2013. Application of Monte CarloSimulationin Chemical Engineering. Yogyakarta:GajahMada University Press.