

## EFFICACY OF GOGHRUTA ON LIPID PROFILE IN DWANDVAJ PRAKRUTI

DR. MALVIKA TAMBE<sup>1</sup>, DR. HEMANGINI WAGHULADE<sup>2</sup>

<sup>1</sup>D.Y. Patil School of Ayurveda, DY Patil Deemed to Be University, Nerul, Navi Mumbai, India

<sup>2</sup>Professor, Department of Kriya Sharir, D.Y. Patil School of Ayurveda, DY Patil Deemed to Be University, Nerul, Navi Mumbai, India

### ABSTRACT

**Background-**Ayurveda's main aim is to prevent diseases. For a healthy lifestyle, Ayurveda stresses a lot on having *sneha* (unctuous food), especially *Goghruta*. Today's lifestyle is devoid of any discipline leading to many health issues like heart disease, obesity, diabetes, etc. Invariably the common finding in these diseases is elevated lipid profile leading to exclusion of unctuous food from the diet. Still, the count of people suffering from these diseases is increasing day by day. Ayurveda states ghee is an important nutrient for all. It also describes various benefits of consuming *ghruta* in different *prakruti*. So, there is a need to understand the relation of *prakruti* with respect to the metabolism of lipids and to establish the precedence of *snigdhatva* (unctuousness) in food as stated in Ayurved physiology for achieving longevity and health. The evaluation of efficacy of *goghruta* on lipid levels in *dwandvaj prakruti* was the primary objective of the study. **The methodology** The study has been conducted on individuals with normal lipid profiles for a period of 45 days. The participants were divided into six groups according to *Prakruti* and were evaluated for all 5 parameters (serum cholesterol, serum triglyceride, serum HDL, serum LDL, serum VLDL) of lipid profile prior to and after *Goghruta* consumption with a meal for a period of 30 days on a daily basis. Lipid profile was studied on day 15, day 30, and without giving *Goghruta* at day 45. **Observation and result-**It has been observed that daily intake of 30 ml of *Goghruta* increases serum HDL level only in subjects of *Vata Kapha Prakruti*. *Vata Prakruti* persons may have the physiology of absorption of good cholesterol into the body due to *Ruksha* (dry) property. Thus, a relation between *Goghruta* and healthy cholesterol is established. *Goghruta* does not increase the levels of serum cholesterol, serum triglyceride, serum LDL, serum VLDL. It is irrespective of *Prakruti*. **The conclusion-**The study concluded that *Sneha* is indeed an important element in the food. *Goghruta* up to 30ml can be consumed by the persons of all *Prakruti* on daily basis.

**Keywords-** *Goghruta*, Ghee, *Ghruta Prakruti*, Lipid Profile, Cholesterol, Diet

### INTRODUCTION

Ayurveda is a science of life. It is very clear about its aims and objectives. Out of its two objectives, the first is to preserve the health of a healthy person and the second is to cure the disorders, if the person falls ill. In general, Ayurveda focuses more on the prevention of diseases rather than cure. In order to promote this, Ayurveda stresses a healthy lifestyle that includes a diet and behavioral pattern. It guides you with equal efficiency right from the small aspects of life like how to brush your teeth, take bath, to very important aspects like how what, where.....to eat, how to behave in society, etc. It goes further and elaborates the three basic pillars for strengthening the existence of mankind viz Food, Sleep and Celibacy.<sup>1</sup>

Ayurveda has set certain ground rules for consuming food to maintain health.<sup>2</sup> It further states that unctuousness in food increases the digestive fire, helps in assimilation, anabolic metabolism in the body, pacifies *vata dosha*, increases sensory strength, and improves general

strength and complexion.<sup>3,4</sup> Ayurveda also states that *ghruta* (ghee) should be consumed on a daily basis.<sup>5</sup>

In this way Ayurveda provides a complete and systemic understanding about the effect of food on our physical and mental functioning in general and also according to the *prakruti* (constitution).

In today's time to match with the fast pace of life, people are compromising a lot on their daily schedule. Neck-to-neck competition to existing in this material world has changed them into machines. To compete and co-exist, every individual is facing a lot of stress and anxiety. Due to lack of time, instead of cooking a fresh and healthy meal, people are tending more towards junk food and quick snacking creates an imbalance in the body leading to lifestyle disorders like indigestion, acidity, obesity, hypocholesteremia, CHD, etc. While evaluating these life style disorders one can link the problems easily to vitiated *vata* and *pitta dosha* (biological humor. One of the main common findings in all these diseases is elevated levels of lipid profiles. Due to this, modern science is gradually tending towards reducing fat percentage in the daily diet in general. Due to this misconception or myth prevalent in today's society about fat, people are not sure about consuming *ghee*, oil, etc. They are terrified of the relation of *sneha* (unctuousness) with cholesterol and heart disease. Whereas, Ayurveda states ghee as an important nutrient for all. It also describes various benefits of consuming *ghruta* in different *prakruti*. So, there is a need to understand the relation of *prakruti* with respect to the metabolism of lipids. This will help us to clear the status of 'sneha consumption' in all the *prakruti* for maintaining health as stated by Ayurveda. The present clinical study was planned with an objective to evaluate the efficacy of *goghruta* on lipid levels in *dwandvaj prakruti* and to know the relation between lipid levels in *dwandvaj* (dual) *prakruti*. It will help to establish the importance of *snighdatva* (unctuousness) in food as stated by Ayurveda.

## MATERIALS AND METHODS

A review of Ayurveda literature has been taken regarding *prakruti and goghruta*. Also, Modern literature has been reviewed for lipid profiles. It is a single arm prospective clinical study. The study was conducted on 50 individuals after taking informed consent with a normal lipid profile for a period of 45 days. Keeping the safety of participants in mind the BMI > 25 has been kept as an exclusion criterion and an intermediate lipid profile screening has been done after 15 days of *Goghruta* intake.

The *Prakruti* was assessed with the help of Ayusoft software. The screening lipid profile test was done and Santulan Annayog's Santulan Ghruta after standardization has been given in 30ml (27.2g) /day i.e. *hrasiyasi matra*<sup>6</sup> (minimum quantity) with meal i.e. *Sabhukta* for 15 days. In modern literature, the allowed limit of fat for a normal working individual is 60g per person. Out of which 30g should be saturated fat and 30g should be unsaturated fat. 30ml of Ghruta quantity was finalized on the basis of a common grounds of both modern and Ayurvedic science. After 15 days, a lipid profile has been done to ensure that the lipid profile was still within the normal limit. The *Goghruta* intake has been continued as per protocol for the next 15 days and a third blood test was done. After completing *Goghruta* consumption a blood test was followed at 45 days to assess the changes in lipid profile with the absence of *Goghruta*.

Statistical analysis was carried out using ANNOVA test. Data was presented as mean,  $\pm$ SD). Before the Trial, an ANOVA test was used to compare Lipid levels between the groups. Doing a multiple two sample 't' test would increase the chances of statistical error. To avoid this error ANOVA test was used for multiple group comparison. After the Trial, an ANOVA test was used to compare Lipid levels between the groups. Wherever there was significant change 'Post Hoc Tests' Bonferroni was applied. Bonferroni correction is a method used for correcting problems of multiple comparisons. Paired T test was used to compare lipid

levels within the group i.e. For Cholesterol, Triglyceride, HDL, LDL and VLDL. Subjective parameter analysis was done by Chi-Square test. Mean and SD was used to describe the data.

### OBSERVATIONS & RESULTS

During the study, it has been observed that some participants felt *Sneha Dwesh* for the first 1-2 days i.e., they felt affliction towards *Goghruta* intake as maybe they were used to having a dry diet. After 2 days participants were comfortable.

The study was conducted on total 53 participants with an age range of 18-50 yrs. 2% of participants were below 20 yrs, 49% of the participant were from 20-30 yrs of age, 30% of the participants were from 30-40 yrs of age, and 19% of the participants were of 40-50 yrs of age. 72% of the participants were male and 28% of the participants were female. Due to propaganda of relation of Ghee or fat with weight gain, female participants were reluctant to join the study so 72% of the participants were male. 57% of the participants were non vegetarian and 43% of the participants were vegetarian.

The participants were divided in to three groups according to *Prakruti* i.e. *Vata-Pitta*, *Vata-Kapha*, *Kapha-Pitta* (3 groups) and were evaluated for all 5 parameters (serum cholesterol, serum triglyceride, serum HDL, serum LDL, serum VLDL) of lipid profile prior to *Ghruta* consumption. Though Ayurvedic scriptures explain 3 groups of *Dwandvaj Prakruti*, it is observed that due to dominance of each dosha, 6 groups of *Prakruti* are found in practice. So sub-grouping was done as *Vata Pitta* (VP), *Pitta Vata* (PV), *Kapha Vata* (KV), *Vata Kapha* (VK), *Kapha Pitta* (KP), and *Pitta Kapha* (PK) and evaluated for all 5 parameters of lipid profile. Statistical tests were applied on six groups of *Dwandvaj Prakruti*.

**Table No. 01**

Comparison of Cholesterol from Base to 30 Days in each group						
Groups	Baseline		30 Days		Paired t	P
	Mean	Sd	Mean	Sd		
KP (10)	159.80	29.91	174.20	31.86	3.630	0.005 Sig
PK (10)	149.80	37.72	163.15	29.80	1.619	0.140 NS
KV (6)	173.33	22.49	188.33	34.66	2.287	0.071 NS
VK (7)	170.29	33.84	163.14	25.37	0.587	0.579 NS
VP (10)	173.70	31.60	170.30	37.14	0.713	0.494 NS
PV (10)	174.40	25.55	185.20	20.67	2.033	0.073 NS

**Result** - Significant for *Kapha Pitta Prakruti*.

**Table No. 02**

<b>Comparison of Triglyceride from Base to 30 Days in each group</b>						
Groups	Baseline		30 Days		Paired t	P
	Mean	Sd	Mean	Sd		
KP (10)	127.10	67.51	107.80	39.40	1.472	0.175 NS
PK (10)	109.95	47.93	122.40	37.87	1.210	0.257 NS
KV (6)	101.33	56.18	108.83	35.91	0.624	0.560 NS
VK (7)	73.71	17.24	86.14	19.90	1.975	0.096 NS
VP (10)	98.90	51.36	88.90	31.71	0.902	0.390 NS
PV (10)	108.50	46.25	105.60	42.34	0.290	0.778 NS

**Result** - Comparison of Triglyceride from Base to 30 days is not significant.

**Table No.03**

<b>Comparison of HDL from Base to 30 Days in each group</b>						
Groups	Baseline		30 Days		Paired t	P
	Mean	Sd	Mean	Sd		
KP (10)	36.00	10.43	34.60	5.25	0.347	0.737 NS
PK (10)	39.80	16.03	32.90	7.50	1.308	0.223 NS
KV (6)	36.33	4.84	41.33	14.00	1.005	0.361 NS
VK (7)	41.29	10.21	46.43	12.65	0.693	0.514 NS
VP (10)	30.00	3.40	30.90	4.63	1.014	0.337 NS
PV (10)	38.20	13.15	34.20	8.65	0.936	0.374 NS

**Result** - Comparison of HDL from base to 30 Days is not significant.

**Table No.04**

<b>Comparison of LDL from Base to 30 Days in each group</b>						
Groups	Baseline		30 Days		Paired t	P
	Mean	Sd	Mean	Sd		
KP (10)	98.70	29.17	118.10	24.36	2.898	0.018 Sig
PK (10)	88.20	40.58	105.80	27.92	1.433	0.186 NS
KV (6)	116.67	24.30	125.33	34.92	1.165	0.296 NS

VK (7)	114.29	30.93	99.71	26.87	1.332	0.231 NS
VP (10)	126.89	23.11	124.67	31.58	0.434	0.676 NS
PV (10)	106.50	40.36	130.30	21.73	1.774	0.110 NS

**Result** - Significant for *Kapha Pitta Prakruti*.

**Table No.05**

Comparison of VLDL from Base to 30 Days in each group						
Groups	Baseline		30 Days		Paired t	P
	Mean	Sd	Mean	Sd		
KP (10)	25.40	13.49	21.50	8.05	1.509	0.165 NS
PK (10)	21.90	9.67	24.40	7.60	1.194	0.263 NS
KV (6)	20.33	11.27	21.83	7.25	0.603	0.573 NS
VK (7)	14.71	3.45	17.14	4.14	1.942	0.100 NS
VP (10)	19.70	10.29	18.00	6.32	0.727	0.486 NS
PV (10)	19.70	7.07	21.20	8.42	0.630	0.544 NS

**Result** - Comparison of VLDL from base to 30 days in is not significant.

**Table No. 06**

Serum Cholesterol	
	mean
Baseline	166.24
45th day	167.72
30th day	173.60
45th day	167.72

Table no 06 shows that Comparison between baseline serum cholesterol level and 45th day is not significant whereas comparison between 30th day serum cholesterol and 45th day level is significant.

**Table No. 07**

<b>Serum Triglyceride</b>	
	mean
Baseline	105.11
45th day	94.74
30th day	103.82
45th day	94.74

Table no 07 shows that the Comparison between baseline serum triglyceride level and 45th day is not significant whereas comparison between 30<sup>th</sup>-day serum triglyceride and 45<sup>th</sup>-day level is significant.

**Table No. 08**

<b>Serum HDL</b>	
	mean
Baseline	36.64
45th day	37.31
30th day	35.83
45th day	37.31

Table no 08 shows that Comparison between baseline serum HDL level and 45th day and comparison between 30<sup>th</sup>-day serum HDL and 45<sup>th</sup>-day level is not significant.

**Table No. 09**

<b>Serum LDL</b>	
	mean
Baseline	107.1
45th day	112.24
30th day	117.1
45th day	112.24

Table no 09 shows that the Comparison between baseline serum LDL level and 45th day is not significant and the comparison between 30<sup>th</sup>-day serum LDL and 45<sup>th</sup>-day level is not significant.

**Table No. 10**

Serum VLDL	
	mean
Baseline	20.62
45th day	18.83
30th day	20.8
45th day	18.83

Table no. 10 shows that comparison between baseline serum VLDL level and 45th day is not significant whereas comparison between 30<sup>th</sup>-day serum VLDL and 45<sup>th</sup>-day level is significant. There is a decrease in serum VLDL level after stopping the consumption of *Goghruta* which is lesser than the baseline VLDL level.

## DISCUSSION

Ayurveda's main aim is to prevent diseases. For a healthy lifestyle, Ayurveda stresses a lot on having sneha (unctuous food), especially *Goghruta*. Today's lifestyle is devoid of any discipline leading to many health issues like heart disease, obesity, diabetes, etc. Invariably the common finding in these diseases is elevated lipid profile leading to exclusion of unctuous food from the diet. Still, the count of people suffering from these diseases is increasing day by day. Ayurveda states ghee is an important nutrient for all. It also describes various benefits of consuming *ghruta* in different *prakruti*. So there is a need to understand the relation of *prakruti* with respect to metabolism of lipids and to establish the precedence of *snigdhatva* (unctuousness) in food as stated in Ayurved physiology for achieving longevity and health.

In table no 11 the comparison of cholesterol level from base to 30 days of paired t-test for KP *Prakruti* is significant, and non-significant for PK, KV, VK, VP, and PV *Prakruti*. Though the change in cholesterol is not significant at 30 days by ANOVA test, paired't' test showed significant rise in serum cholesterol level compared to other *Prakruti* but within the normal limit. As *Kapha* is *Snigdha* and *Pitta* has *Sasneha* property so according to *Samanya Vishesh Siddhant* this change may occur in cholesterol in KP *Prakruti*.

Table no 12 shows that the comparison of serum triglyceride level at 30th day and 6 groups is non-significant. It denotes consumption of *Goghruta* 30 ml/day doesn't increase serum triglyceride level in all 6 groups of *Prakruti*.

Table no 13 shows that the comparison of serum HDL level at 30th day and 6 groups is significant. It denotes consumption of *Goghruta* 30 ml/day increase serum HDL level in *Vata prakruti*.

Table no 14 shows that the comparison of serum LDL levels at 30th day and 6 groups is significant. Though the change in LDL is not significant at 30 days but paired't' test signifies that change within the normal limit is seen more in *Kapha Pitta Prakruti* as compared to other *Prakruti*. As *Kapha* is *Snigdha* and *Pitta* is also *Snigdha* so may be due to *Samanen Saman Vruddhi Nyaya* there is an increase in LDL.

Table 15 shows that the comparison of serum VLDL level at 30th day and 6 groups is non-significant. It denotes consumption of *Goghruta* doesn't increase serum VLDL level in all 6 groups of *Prakruti*.

After completion of *Goghruta* consumption subjects were asked to come again for a lipid profile test at 45 days. This test was done to assess the change in lipid profile parameters in absence of *Goghruta*.

Table no 16 shows that the Comparison between baseline serum cholesterol level and 45th day is not significant whereas comparison between 30<sup>th</sup>-day serum cholesterol and 45<sup>th</sup>-day level is significant. This shows that in the insignificant rise seen in table 6B in serum cholesterol is reduced immediately in absence of *Goghruta*. This denotes that *Goghruta* digestion and assimilation are good. Even if it's consumed in large doses giving rise to high cholesterol levels, the body can digest it very fast and there will be no long-lasting effect on the serum cholesterol level.

Table no 17 shows that the Comparison between baseline serum triglyceride level and 45th day is not significant whereas the comparison between 30<sup>th</sup>-day serum triglyceride and 45<sup>th</sup>-day level is significant. This denotes that *Goghruta* digestion and assimilation is very efficient even after discontinuing the intake of *Goghruta* due to an increase in digestive fire the triglycerides keep on reducing.

Table no 18 shows that Comparison between baseline serum HDL level and 45th day and comparison between 30<sup>th</sup>-day serum HDL and 45<sup>th</sup>-day level is not significant. But the mean values show that the level of HDL has increased even after discontinuing consumption of *Goghruta*. This may be due to its *Hridya* property. (Reference *Nighanturatnakar*). It denotes that the good effect of *Goghruta* sustains which may prove beneficial for the heart with respect to good cholesterol.

Table no 19 shows that the Comparison between baseline serum LDL level and 45th day is not significant and the comparison between 30<sup>th</sup>-day serum LDL and 45<sup>th</sup>-day level is not significant.

Table no 20 shows that the Comparison between baseline serum VLDL level and 45th day is not significant whereas comparison between 30<sup>th</sup>-day serum VLDL and 45<sup>th</sup>-day level is significant. There is a decrease in serum VLDL level after stopping the consumption of *Goghruta* which is lesser than the baseline VLDL level. This denotes that even after discontinuing the consumption of *Goghruta* due to an increase in digestive fire the VLDL keeps on reducing.

From these observations, it can be stated that *Goghruta* can be consumed in *Hrasiyasi Matra* on daily basis. 30 ml dose per day does not alter the Lipid levels significantly. So it can be consumed safely by everyone.

## CONCLUSION

- 1) There is no association between lipid levels and *Dwandvaj Prakruti*.
- 2) Daily intake of 30ml of *Goghruta* increases serum HDL level only in subjects of *Vata Kapha Prakruti*. *Vata Prakruti* persons may have the physiology of absorption of good cholesterol into the body due to *Ruksha* property. Thus, a relation between *Goghruta* and healthy cholesterol is established.
- 3) *Goghruta* does not increase the levels of serum cholesterol, serum triglyceride, serum LDL, serum VLDL. It is irrespective of *Prakruti*. Hence *Goghruta* up to 30ml (*Hrasiyasi Matra*) can be consumed by the persons of all *Prakruti* on daily basis.
- 4) Serum cholesterol and serum LDL has been found to be elevated insignificantly and within the normal limit only in study subjects of *Kapha Pitta Prakruti*. As *Kapha* is *Snigdha* and *Pitta* is also having *Sasneha* property so according to *Samanya Vishesh Siddhant*, there is an increase in serum cholesterol in *Kapha Pitta Prakruti* subjects. The safe amount as per the study was 30ml per day. While prescribing *Goghruta* above 30ml (*Hrasiyasi Matra*) *Prakruti* of that particular individual has to be considered. Thus, the relation between *Sneha* consumption and *Prakruti* is established.
- 5) Study establishes that *Goghruta* doesn't have a harmful effect on lipid levels.
- 6) *Sneha* is indeed an important element in food. It should be consumed on regular basis.



### SCOPE AND LIMITATION OF STUDY-

The goal of the study was to establish a relation between *Sneha* consumption and *Prakruti* and to know the effect of *Goghruta* in different *Prakruti*. This study has established a relation between *Prakruti* and *Sneha* consumption. Also, it establishes that *Goghruta* doesn't have a harmful effect on lipid levels rather it increases healthy cholesterol.

A future study with large sample size and for a longer duration will be helpful to assess the daily requirement of *Goghruta* in the general population according to *Prakruti*. This study can act as a base for further research.

The study has proven an age-old concept of Ayurveda which paves the way to the revalidation of a similar concept.

There is a need to bring awareness about fat consumption in society that a reasonable amount of saturated fat consumption poses no health risk, on the other hand, it may improve their day-to-day life.

### REFERENCES

1. Vaidya Jadavaji Trikamji (editor). Commentary: Ayurveda Deepika of Chakrapani on Charaka Samhita of Charaka, Sutra Sthana, Chapter 11, Verse no.35, 1st edition, Varanasi: Choukhambha Surbharati Prakashan; 2005; 74
2. Vaidya Jadavaji Trikamji (editor). Commentary: Ayurveda Deepika of Chakrapani on Charaka Samhita of Charaka, Vimana Sthana, Chapter 1, Verse no.24, 1st edition, Varanasi: Choukhambha Surbharati Prakashan; 2005; 236
3. Vaidya Jadavaji Trikamji (editor). Commentary: Ayurveda Deepika of Chakrapani on Charaka Samhita of Charaka, Vimana Sthana, Chapter 1, Verse no.25, 1st edition, Varanasi: Choukhambha Surbharati Prakashan; 2005; 236
4. Pt. Hari Sadashiva Shastri Paradkar (editor). Commentary: Sarvangasundara of Arundatta and Ayurvedarasayana of Hemadri on Ashtanga Hridaya of Vagbhata, Sutra Sthana, Chapter 16, Verse no.46, 6th edition, Varanasi: Chaukhamba Surbharati Prakashan; 2002; 253
5. Pt. Hari Sadashiva Shastri Paradkar (editor). Commentary: Sarvangasundara of Arundatta and Ayurvedarasayana of Hemadri on Ashtanga Hridaya of Vagbhata, Sutra Sthana, Chapter 8, Verse no.42-43, 6th edition, Varanasi: Chaukhamba Surbharati Prakashan; 2002; 157
6. Pt. Hari Sadashiva Shastri Paradkar (editor). Commentary: Sarvangasundara of Arundatta and Ayurvedarasayana of Hemadri on Ashtanga Hridaya of Vagbhata, Sutra Sthana, Chapter 16, Verse no.18, 6th edition, Varanasi: Chaukhamba Surbharati Prakashan; 2002; 246