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Traditional weaning foods and practices in Jabalpur district with reference to prevalence of malnutrition

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ABSTRACT

Weaning is an important milestone in a baby's life and weaning practices are strongly associated with culture of a society. In present investigation, an extensive survey was conducted on approximately 300 weaning children belonging to 12 Anganwadis (AWW) of 6 Integrated Child Development Scheme (ICDS) regions lying in Jabalpur District to identify the traditional dietary pattern of weaning children. The diets of children were deficient in calories, protein, calcium, vitamin C and b-carotene. Supplementary foods are introduced into the diet at the ages of 4 to 8 months of children. Moderate to severe category of malnutrition was observed. Identified traditional weaning foods were based on cereals, small millets and pulses. Most prevalent traditional weaning foods of Jabalpur were found to be *khichadi, dalia, roti (*wheat/maize*/kutki), sattu, pej (kodo/*maize*/kutki), panjiri, sewai, dal (*lentil/*arhar/batari), chawal (kodo/kutki/*paddy*), kudai bhat, latchaka (kodo/*maize*) and rejgeera ladoo.*

Key words: Dietary pattern, Identification, ICDS centers, Malnutrition, Traditional weaning foods, Weaning practices.

INTRODUCTION

Infants and preschool children, who make about 17 per cent of the total population, contribute to almost 90 per cent of the total deaths and hence they are the most vulnerable segment of the population (IIPS, 2000). Feeding especially in early years of life of the child has a lifelong effect since varying degrees of growth retardation have been observed in infants and children because of malnutrition. Malnutrition as well as "Micronutrient malnutrition" also known as "hidden hunger" is a global public health problem of our planet and affects the quality of human resource development and productivity of any country. These are the most widespread condition affecting the health of children and are one of the major national problems, claiming innumerable lives every year in the developing countries. It has been estimated that approximately 6000-7000 of 0-5 year's children; die every day of malnutrition in India (Food and Nutrition News, 2000).

In India and M.P., the percentage malnutrition of children under three year's age is: underweight prevalence - 47.08 and 55.1, stunting growth prevalence - 45.5 and 51.0 and wasting prevalence-15.5 and 19.8, respectively (IIPS, 1999). According to NNMB (National Nutrition Monitoring Bureau) survey (2002), in Madhya Pradesh the percentage of malnourished rural children (1-5 years) is 63.0 (India-47.7). Widespread micronutrient deficiencies continue to exert a high toll in the developing world as an underlying factor for increased morbidity and mortality.

The infant and child mortality rate is the key indicator illustrating the level of human development of a nation or state. The Infant Mortality Rate(IMR ,deaths per 1000 births) is 88 in Madhya Pradesh and 68 in India (The Indian Child: A profile, 2002) whereas; U5MR (under five mortality rates) is 137 in Madhya Pradesh (IIPS,2000) and 96 in India(KIDS COUNT,2002). According to International Institute of Population Sciences (IIPS, 2000), the highest IMR was found in rural areas of the State of Madhya Pradesh.

Weaning practices that are followed depend on the knowledge, beliefs, attitude and environment of the mother. The weaning practices are strongly associated with culture of a society. Food consumption patterns and foods beliefs pertaining to weaning children vary not only from one place to another but also differ within the same community. Traditional foods have occupied a unique place in the dietary practices of any country. A myriad variety of traditional foods available in India represent the geographical and seasonal influences on food pattern. They are based on single or

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judiciously blended mix of local agriculture produce to meet the nutritional needs of the people (Parpia, 1999). However, traditional weaning foods and practices of Jabalpur District have remained largely un-searched and unexplored. There is an overall lack of awareness, where nutritional value of traditional weaning foods is concerned. Under the light of the above scenario, the present investigation was undertaken with the specific objective to assess the traditional dietary pattern of weaning children, nutritive value of identified traditional weaning foods as well as prevalence of malnutrition in Jabalpur District of Madhya Pradesh.

MATERIALS AND METHODS

Study area: The study was confined to Jabalpur district of Madhya Pradesh consisting six regions as ICDS-I, ICDS-II (urban areas), Patan, Shahpura (rural areas), Kundam and Dhimarkheda (tribal areas). From each region two ICDS/AW (Integrated Child Development Scheme/Anganwadi) centers – one located near all weather roads and one located in interior part (5-10 kms from block head quarters) were selected purposely to take representative samples. In all, 12 ICDS centers were selected to fulfill the stated objectives.

Target audience and selection of sample: Mothers of 6 months to 3-year-old children were the target audience for the study. A list of all the weaning children was prepared with the help of AWW (Anganwadi Worker) of the selected ICDS centers. A sample of 20 per cent weaning children was chosen by simple random sampling method. The dietary pattern of approximately 300 children from 12 anganwadi of the 6 ICDS regions of Jabalpur district was surveyed.

Diet survey: The primary data i.e. demographic and socioeconomic particulars of the household were obtained from the personal-interviews. The SES scale of Pareek and Trivedi (1963) was used for socioeconomic status with slight modification as per study. The survey was conducted to assess the traditional dietary pattern of weaning children under the age group of 3 years for identification of traditional weaning foods of the region. Pre-tested structured respondent schedule used was based on the recommendations of the regional workshop on Indian traditional foods (RWITF, 1996) to collect the data on infant feeding and weaning practices. After the identification of traditional weaning foods of the region, their nutritive value in terms of proximate principles, energy value and other essential nutrients (calcium, phosphorus, iron, β-carotene and ascorbic acid) were computed through food tables (Rao *et al*, 1989). The growth chart (Average weight for age) prescribed by the ICDS centers at national level has been used for the assessment of malnutrition of children below 3 years.

RESULTS AND DISCUSSION

Diet survey: Weaning practices that are followed depend on the knowledge, beliefs, attitude and environment of the mother. The weaning practices are strongly associated with culture of a society. From time immemorial, the tribes living in isolated pockets have been practicing distinctive ways of infant feeding. Practices about infant feeding and weaning are varied and despite various developments tend to fall back to its original eco-cultural pattern. Food consumption patterns, weaning practices and food beliefs pertaining to infant and weaning children vary not only from one place to another but also differ within the same community. However the information available on weaning children of Jabalpur district is very meager. Hence, the extensive survey work was taken up with a view to understand the dietary pattern of weaning children of Jabalpur.

The information regarding dietary pattern of weaning children, type of food, weaning practices were collected from mothers who had child‘ between ages of 5 months to 3 years. The knowledge about commencement and type of supplementary foods, their sources, amount, and periodicity were also collected. Information about occupation, socioeconomic background, income, number of family members with their age, number of earning member, cultivation of crops and land etc. were collected. The dietary pattern of approximately 300 children from 12 Anganwadis of the 6 Integrated Child Development Services (ICDS) regions of Jabalpur District was surveyed. The ICDS started in 1975 has the strategy of delivery of early childhood services in an integrated manner, with the weaning period as the focal point. From each ICDS region, two ICDS centers – one located near all weather roads and one located in interior part was selected purposely because these two ICDS centers located in two different areas hence their feeding and weaning practices were bound to be different from one another.

General profile: Majority of the family under study were below the poverty line. Most of them were engaged in agricultural activities either in their own land or on the farms of some other landlords. The main occupation of households of tribal’s and rural area were based on agriculture and forest; the latter includes selling of wood, herbs *etc.* Women’s participation was also there in agricultural activities. On an average the size of the families was large, above five members. Of the weaning children surveyed, most of them belonged to nuclear type of families. The educational status of the mothers was very low. Few of them were educated up to primary, middle and high school but most of the tribal’s were illiterate. The family meal pattern was monotonous and was poor in quality and quantity.

The main food items of the tribal area are maize, *kodo*, *kutki*, *sanwa*, *jowar*, lentil and *batari* (field pea). Customarily, vegetable protein is very little in their food as pulses and milk are ordinarily absent in their diet. In urban and rural areas, the commonly used foods are wheat, rice, maize, sorghum , red gram, lentil, green gram, field pea etc. Prevalence of signs of nutritional deficiencies Kwashiorkor and Marasmus were in the highest order followed by anaemia. Clinical signs noticed were associated with deficiencies of vitamin A (conjunctival xerosis and Bitot's spot) and B vitamin (angular stomatitis and skin diseases). In addition, the prevalence of respiratory tract infections and gastro-intestinal disorders, this could be attributed to the poor nutritional status, environmental sanitation and personal hygiene among children.

The average weight for age of children below 3 years fell below on the growth chart used by ICDS centers .The data in Table 1 showed that in ICDS-I and II region, which belongs to the urban areas of Jabalpur district, most of the children surveyed exhibited the general to grade II malnutrition, in the ICDS centers located on the road side and grade II to grade III, in ICDS centers located in interior part. In Patan and Shahpura blocks which belong to the rural areas of Jabalpur district, the children belonged to general to grade III malnutrition in ICDS centers located on road side and grade II to grade III in ICDS centers located in the interior part. The highest degree of malnutrition was prevalent in tribal blocks of Jabalpur district consisting of Dhimarkheda and Kundam blocks in which the children were suffering from general grade to grade III malnutrition in ICDS centers located on road side and grade II to grade IV malnutrition was exhibited by children of ICDS centers located in interior part.

From the above findings it was clear that the diets of children were deficient in calories, protein, calcium, vitamin C and β-carotene. The severe forms of PEM (Grade III and IV) were associated significantly with non nutritive food intakes by them. These faulty foods may cause not only PCM, but also deficiency of vitamins like A, B, C and calcium among them. Although, there are several factors responsible for this, an improper traditional weaning food seems to be the most prominent one.

Weaning practices: Data regarding the weaning practices of child are furnished in Table 1. A large variation was observed in weaning practices of different regions of Jabalpur district. Supplementary foods are introduced into the diet of children at different stages. All of them received supplements before the age of one year. In urban area, infants received supplements earlier at the age of 4-6 months as compared to tribal and rural areas whereas others received supplementary foods during the subsequent months (6 to 8 months) of the life. The early introduction of supplementation in the urban area was found associated with the employment of the mothers. Mothers, who went outside home for job, introduced supplementary foods at an early age of 4 months than those who stayed at home.

Data in Table 1 depicts that children were completely weaned at the age of 18 to 24 months in urban areas whereas in rural and tribal area they weaned completely at the age of 24 to 30 months of life. Weaning

TABLE 1: Prevalence of malnutrition grades and weaning practices in different ICDS regions of Jabalpur.

Area	Region (Road/ Interior)	Village	Malnutrition Grade* & Percentage	Weaning Age*
Urban	ICDS-I			
	Road	Gohalpur	Grade I-II (56%)	6 to 18 months
	Interior	Marhatal	Grade II-III (60%)	6 to 24 months
	ICDS-II			
	Road	Badhaiapura	General to Grade-I (60%)	5-6 to 18-24 months
	Interior	Ghamapur	Grade II-III (64%)	4-6 to 18-24 months
Rural	Patan			
	Road	Udna Sadak	General to Grade I (64%)	5-6 to 24 months
	Interior	Gadaghat	Grade II-III (72%)	7 to 30 months
	Shahpura			
	Road	Sahajpur	Grade II-III (68%)	7 to 30 months
	Interior	Bhamki	Grade III (72%)	7-8 to 24 months
Tribal	Dhemerkheda			
	Road	Dhemerkheda	Grade II-III (72%)	6 to 24 months
	Interior	Mangela	Grade III-IV (84%)	7 to 30 months
	Kundam			
	Road	Sadafal	General to Grade-I (68%)	6 to 24 months
	Interior	Unchehara	Grade II-III (80%)	5 to 24 months

ss* Average of 25 participants

TABLE 2: Nutritive value of identified traditional weaning foods of' Jabalpur District

Recipe (One serving)	Energy (Kcal)	Protein (g)	Fat (g)	Carbohydrates (g)	Fiber (g)	Iron (mg)	Calcium (mg)	Phosphorus (mg)	Carotene (µg)	Asorbic Acid (mg)
Rajgeer Laddoo (20g)	66.95	2.04	0.28	13.80	1.44	1.78	80.50	61.50	-	-
Sattu (20 g)	73.34	4.08	0.77	12.90	0.38	0.93	13.70	62.60	4.37	0.01
Sewai (15 g)	51.15	1.80	0.25	10.41	0.28	0.70	7.20	53.25	4.35	-
Kodo Pej/lachka (8 g)	24.72	1.24	0.21	5.20	0.72	0.04	2.16	15.04	-	-
Maize pej/lachka (8 g)	27.36	0.80	0.28	5.29	0.21	0.18	0.80	27.80	-	7.20
Lai Laddoo (20 g)	72.54	0.57	0.01	17.45	0.02	0.80	12.01	15.70	-	-
Dalia (15 g)	51.15	1.80	0.25	10.40	0.28	0.73	7.20	53.25	4.35	-
Panjiri (40 g)	172.55	3.14	5.54	27.50	0.73	1.30	18.24	92.00	44.80	-
Rice kheer (50 g)	134.60	1.65	1.20	19.06	0.02	1.33	37.01	43.01	15.90	0.60
Dal Pani (10 ml)	33.50	2.23	0.17	5.76	0.15	0.27	7.30	30.40	13.20	-
Arhar	34.30	2.51	0.07	5.90	0.07	0.75	6.90	29.30	27.00	-
Lentil	34.80	2.45	0.12	5.99	0.08	0.39	7.50	40.50	4.90	-
Moong	31.50	1.97	0.11	5.65	0.45	0.70	7.50	29.80	3.90	-
Batri Poha (40 g)	152.25	2.68	7.25	19.02	0.33	4.60	9.50	69.10	34.20	1.70
Dal (15g)										
Arhar	50.25	3.30	0.25	8.64	0.22	0.40	10.95	45.60	19.80	0
Lentil	51.45	3.76	0.10	8.85	0.10	1.13	10.35	43.95	46.50	-
Moong	52.50	3.67	0.18	8.98	0.12	0.58	11.25	60.75	7.35	-
Batri	47.25	2.95	0.16	8.47	0.67	1.05	11.25	44.70	5.85	0
Rice (20 g)	69.00	1.30	0.10	15.64	0.04	0.14	2.00	32.00	0	0
Punga (5 Nos.)	25.95	0.44	1.56	2.53	0.06	0.17	1.75	12.95	0.91	-
Biscuit (20 g)	99.80	1.10	5.09	12.36	0.03	0.27	23.6	12.15	32.50	-
Khichadi (20 g)	69.15	2.22	0.13	14.72	0.07	4.23	17.80	28.75	-	-
Dalia kheer (45g)	89.85	2.02	1.18	17.72	0.12	0.84	42.10	57.10	13.25	0.50
Suji Halwa (35 g)	154.6	2.09	5.16	24.90	0.04	0.33	4.40	20.50	30.00	
Chawal papad (15 g)	79.50	0.68	5.005	7.82	0.02	0.07	1.00	16.00	30.00	-
Chapati (20 g)	69.00	1.36	0.10	15.64	0.04	0.14	2.00	32.00	-	-
Kanki	61.80	1.66	0.28	13.18	1.80	0.10	54.00	37.60	-	-
Kudai	68.40	2.20	0.72	13.24	0.54	0.46	2.00	69.60	1.80	-
Maize	68.20	2.42	0.34	13.88	0.38	0.98	9.60	71.00	5.80	-
Wheat										

had started in High income group of Maharashtra and Mysore city, India by 4 to 6 months (Dodd and Datta, 1988; Vani and Saraswathi, 1998) whereas the majority of the women gave the fermented foods to infants from the age of 4 months in Mashonaland, Zimbabwe (Simago (1997). The supplementary food started between the ages of 3 to 9 months in Hisar, Haryana (Kaur *et al,* 1990), whereas in Kerala, the mothers gave weaning food at the age of 2 to 5 months (Smith and Pavunny, 2003). In Ghana, the solids were introduced at the time of 5 to 7 months whereas in Northeast Thailand, infants are weaned at 6-8 months of age (Saowakontha *et al,* 1995). A greater proportion of rural mothers weaned their babies after 18 months of age (EL Bushra *et al,* 1994). The average age of introduction of semisolids was 10.3 months in urban area of India (Kumar *et al,* 1992). All the above findings regarding weaning practices reported by various scientists are well corroborated with the findings of present study whereas the findings are found to be contrary with the results of age of supplementation 1.4 Months, 11 weeks and 6 weeks in Lucknow (India), Glasgow and Northern Thailand respectively (Singh *et al,* 1992; Savage *et al,* 1998; Jackson *et al,* 1992). Nothing can be said for initiation of supplementary food and weaning practice among the children of all the regions, as it is traditional. There is no definite pattern for this.

In general, the period of exclusive breast feeding is followed first by the introduction of liquid supplementary foods, and then by semisolid supplements. The weaning diets were highly cereal based although its consumption also did not meet the recommended allowances at all. The diets were strikingly deficit in protective foods and thus were ill balanced. The nutritional profile of identified traditional weaning foods (Table 2) prevalent in Jabalpur district were grossly deficient in comparison with ICMR recommendations of 1998.The meal pattern of the children (0-3 years age group) were by and large on the lines of adult meal pattern. The problem of deficit was not only in terms of calories and proteins but also of vitamins, fats and minerals. Fruit juices, green leaves and eggs were used by very few mothers. Fruit juices were considered as cold foods and allergic to children whereas eggs were avoided due to social inhibition. So none of the food supplement given to children supply ascorbic acid. Green leafy vegetables were also not included in the supplements.

The identified traditional weaning foods of the region through extensive survey were sorted out and presented in Table 3. In tribal blocks *rajgeera ladoo, pej, kanki roti, dalia* (provided by ICDS), *khichadi* are the common traditional weaning foods used by them whereas in rural blocks *dalia, kheer, suji halwa, sevai ,sattu* and rice *kheer* are the most common traditional weaning foods. In urban areas, *suji halwa*, rice *kheer, rajgeera ladoo, lai ladoo, dal pani* and *panjiri* are commonly used. In addition to this, the important staple foods i.e. *dal, chawal*, wheat *chapati* are most frequently used in all areas.

Khichadi and *dalia* as traditional weaning foods used in Hisar (Kaur *et al,* 1990). In addition to this, *dal pani*, rice *kheer, porridge*, curd and wheat are foods used for supplementation in urban muslims of Lucknow (Singh *et al* 1992). *Dal*, *khichadi*, rice, *chapatti* as common weaning foods of urban area in India (Kumar *et al,* 1992). Ogi, an important traditional fermented weaning food in West Africa based on maize and sorghum (Sanni *et al,* 1994). 'Pap', a maize based weaning food commonly used in Nigeria (Igbedioh *et al,* 1995) whereas 'mahewu', a traditional fermented weaning food of Zimbabwe (Simago, 1997).

TABLE 3: Cereal and pulse based traditional weaning foods prevalent in Jabalpur District

Dhimerkheda	Kundam	Shahpura	Patan	ICDS I	ICDS II
Rajgeera - Ladoo	Dalia Dal Chawal	Dalia kheer Suji halwa Dal	Sattu Dal Chawal	Rajgeera-Ladoo	Rajgeera-Ladoo
Dalia	Roti	Chawal	Roti	Dalia	Dalia
Khichadi	Doodh- roti	Roti	Dalia	Sevai	Dal pani
Kanki roti	Pej	Sevai	Sevai	Lai Ladoo	Poha
Dal	Latchaka		Chawal-	Chawal	Dal
Chawal	Kudai- Bhat		Kheer	Papad	Roti
Wheat roti	Kudai roti			Dal	
	Maize- dalia			Chawal	
	Maize pej			Roti	
	Maize roti			Sattu	
				Panjiri	
				Suji Halwa	
				Chawal Kheer	

CONCLUSION

Moderate to severe category of malnutrition was seen in selected regions of Jabalpur district of Madhya Pradesh during survey. The survey also revealed that the main cause of malnutrition among weaning children was lack of proper nutrition in their diet. The diets were strikingly deficit in protective foods and ill balanced. Supplementary foods started between the ages of 4 to 8 months in most of the children included in the study. Traditional weaning foods identified from all regions of Jabalpur district including rural, urban and tribal areas are based on cereals, millets and pulses. A meaningful approach in the management of malnutrition needs a correct understanding of the various etiological factors operating in a particular region and population group. Such base line information is essential and can be useful in planning developmental programs and policies in the region.

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REFERENCES

Dodd N S and Datta S (1988). Effect of the socio-economic level on the infant weaning practices in Maharashtrians. *Indian Journal* of *Nutrition and Dietetics* **25**(8): 259-264.

EL Bushra HM, Salih MAM, Satti SAR, El Fatih M, Ahmed A and Kamil I A (1994). Infant-feeding practices in urban and rural communities of the Sudan, *Tropical and Geographical Medicine* **46**(5): 309-312.

Food and Nutrition News (2000). Acharya N.G. Ranga Agricultural University, 6, 2.

IIPS (International Institute for Population Sciences) (2000). National Family and Health Survey-2, 1998-99, Mumbai, pp. 194.

IIPS (International Institute of Population Sciences) (1999). National Family Health Survey –2, Figures are for 1998-99, data are for children under 3 years of age.

Igbedioh SO, Edache A and Kaka H J (1995). Infant weaning practices of some Idoma women in Makurdi, *Nigeria. Nutrition and Health* **10**(3): 239-253.

Jackson DA, Imong S M, Wongsawasdii L Silprasert A, Preunglampoo S, Leelapat P, Drewett R F, Amatayakul K and Baum J D (1992). Weaning Practices and Breast-feeding Duration in Northern Thailand, *British Journal of Nutriti*on **67**(2): 149-164.

Kaur YP, Kumar V, Sehgal S and Boora P (1990). Infant feeding practices in an urban area. *J. Nutr. Dietet*. **27:** 305-310.

Kumar S, Nath L M and Reddaiah V P (1992). Supplemen-tary feeding pattern in children living in a resettlement colony. *Pediatrics* ***29***(2): 219-222.

KIDS COUNT (2002). Kids Count International Data Sheet, Population Reference Bureau, 1875, Connecticut Avenue, NW Suite, 520, Washington D.C., 2009-5728 USA.

NNMB Survey (2002). The Indian Child: A profile – 2002, Department of Women and Child Development, Ministry of Human Resource Development, Govt. of India, pp. 33.

Parpia HAB (1999). Developing on the heritage of Indian traditional foods. *Indian. J. Nutr. Dietet.*, **36:** 219.

Pareek, Udai and Trivedi G. (1963) Norms for Delhi area of a socio-economic status scale (rural). *Buniyadi Talim*, **6:**120-124.

RWITF (1996). Recommendations of the Regional Workshop on Indian Traditional Foods, CFTRI Regional Centre, Hyderabad during September 19-20, 1996. Organised by Ministry of Food Processing Industries, Govt. of India, New Delhi and Central Food Technological Research Institute, Mysore.

Rao Narsingha BS, Deosthale YG and Pant KC (1989). Nutritive value of Indian Foods. National Institute of Nutrition, Indian Council of Medical Research, Hyderabad.

Simago C (1997). Potential use of traditional fermented foods for weaning in Zimbabwe. *Social Science* & *Medicine* **44**(7): 1065-1068.

Smith ME and Pavunny O (2003). Infant feeding practices among agricultural labourer families. 5th International Food Convention,5-8 December, 2003, Mysore, India. Poster Abstracts, NU-17, pp 29.

Saowakontha S, Chantraphosri V, Kampor P, Ketkowit K, Panomratanarak B, Thaworndunstid P and Nathapindhu K (1995). Breast feeding behaviour and supplementary food pattern of villagers in Udon Thani Province, Northeast Thailand. *Southeast Asian Journal of Tropical Medicine and Public Health*, **26**(1): 73-77.

Singh R, Kumar O A and Rana RS (1992). Breast feeding and weaning practices among urban Muslims of District Lucknow. *Indian Pediatric* **29**(2): 217-219.

Savage S A H, Reilly J J, Edwards C A and Durnin JVGA (1998). Weaning practice in the Glasgow longitudinal infant growth study, Archives of Disease in Childhood, **79**(2): 153-156.

Sanni AI, Loenner C, Marklinder I, Johansson ML and Molin G (1994). Starter cultures for the production of ogi, a fermented infant food from maize and sorghum, Chemie Mikrobiologie *Technologie der Lebensmittel*, **16**(1/2): 29-33.

The Indian Child: A profile (2002). Department of Women and Child Development, Ministry of Human Resource Development, Govt. of India, pp. 89.

Vani N and Saraswathi G (1998). A study on infant feeding practices of selected mothers of Mysore city and assessment of physico-chemical, sensory properties and nutritive value of homemade weaning foods. Poster Abstracts, IFCON'98 Abst. No. J-02, 92